UNITED STATES ARMED FORCES
MEDICAL JOURNAL

Volume VIII September 1957 Number 9

HISTAMINERGIC NERVE EFFECTS IN RELATION TO PEPTIC ULCER

Preliminary Experiments on Dogs

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EMOTIONAL stress is known to induce certain somatic changes that may be related to hyperactivity of the sympathetic nervous system.[1-3] In the normal individual, such sympathetic stimulation causes reduction of gastric acid formation or of gastrointestinal motility.[1,2,4] Clinical observation shows that the peptic ulcer patient under emotional stress experiences an aggravation of his symptoms, usually accompanied by excessive secretion of hydrochloric acid (HCl).[2,5,6] This difference of organ reaction to sympathetic stimulation in the peptic ulcer patient leads us to assume the existence of a constitutional abnormality in his sympathetic nervous system.[5,7] It is the purpose of this study to elucidate the nature of this abnormal predisposition. Our approach to this problem was based on a number of recent findings:

1. Sympathetic nerve structures were found to contain not only adrenergic, but also histaminergic fibers in varying proportions. The existence of such histaminergic fibers was established with the finding that histamine is present in[8-10] and capable of stimulating[10-13] sympathetic nerves and, conversely, that nerve stimulation leads to peripheral histamine release.[8,10,14]

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2. Evidence was adduced to show that psychogenic factors may lead to central stimulation of the histaminergic fibers.[15]

3. It was found that central stimulation of histaminergic fibers may result also from parenteral administration of histamine.[16]

These findings, in conjunction with the long-established fact that histamine is a powerful stimulant of gastric acid secretion,[17,18] prompted us to investigate the mechanism by which histamine causes gastric hyperacidity.

MATERIALS AND METHODS

For each series of experiments, mongrel dogs weighing about 10 kg were used. HCl secretion in response to intravenously administered histamine phosphate (10 gamma/kg) was measured by sampling gastric juice immediately before and 15 and 60 minutes after the histamine administration. Maximum secretion of HCl should have occurred 15 minutes after the injection of histamine, whereas the effect should have largely disappeared after 60 minutes. Because both free and bound HCl had to be determined individually on the samples, the results are recorded separately in the tables.

The specimens were collected by oral insertion of a rubber tube into the stomach of the experimental animals. Twenty-five milliliters of water was injected via this tube and the stomach contents were withdrawn 2 to 3 minutes later. The dogs had received no solid food for 12 hours prior to the procedure. During the testing period, they were given only the measured quantities of water by gastric tube. This unvarying procedure was followed with the controls and after (a) sectioning of the cervical spinal cord below the 5th or 6th vertebra; (b) intravenous administration of hexamethonium (10 mg/kg); (c) intravenous administration of chlorpromazine (0.5 mg/kg); and (d) intravenous administration of amphetamine sulfate (0.2 mg/kg). Sectioning of the cervical spinal cord was performed using Pentothal anesthesia, and attempts to obtain a histamine response were made 1 hr after the administration of Pentothal Sodium (brand of thiopental sodium).

RESULTS

On the assumption that in the dog as in man there are constitutional variations in sensitivity to histamine, 12 dogs were tested in a preliminary control series by the procedure outlined above. Only five responded with strong acid secretion of the gastric glands. Detailed findings on these five are shown in table 1. The other seven dogs failed to respond to either 100 gamma or 5,000 gamma of histamine. Accordingly, *in subsequent series only dogs with demonstrated ability to respond to histamine were used.*

Sectioning of the cervical spinal cord abolished the histamine response (table 2). The autonomic ganglionic blockade induced by hexamethonium had the same effect, lasting for 4 to 8 hr (table 3). Chlorpromazine effectively inhibited the histamine response for the duration of 5 to 7 hr (table 4). Amphetamine prevented the histamine effect upon gastric acid secretion for 5 to 7 hr in 5 out of 6 dogs (table 5).

DISCUSSION

The dogs were accustomed to intubation in order to alleviate their apprehension to this procedure. To obtain relative values for the gastric acidity of the experimental animals, it was necessary to inject a constant amount of water into the stomach, as this organ in the resting state does not contain gastric juice in quantities sufficient for sampling. The cervical spinal cord was severed to obtain complete interruption of all preganglionic sympathetic fibers. Care was taken to leave the phrenic nerves intact. Diaphragmatic breathing was found sufficient for the maintenance of adequate oxygenation. The dogs were anesthetized with Pentothal Sodium, because this ultrashort-acting barbiturate in the dosage used does not interfere with impulse transmission through autonomic ganglia.[19] One hour was allowed to elapse between the surgical and the testing procedures to preclude experimental errors from possible effects of the anesthetic or traumatization.

Our experimental finding that surgical interruption or pharmacologic blockade of impulse transmission through the sympathetic nervous system abolished the histamine effect on the gastric glands indicates (a) that the centrally originating sympathetic structures which innervate the stomach contain histaminergic fibers and (b) that these fibers conduct the central impulses to the stomach. The phenomenon that in the normal individual stimulation of the sympathetic nervous system (through emotional stress) leads to an adrenergic response (reduction of gastric acidity or motility) seems to indicate that, normally, the adrenergic fibers predominate over the histaminergic fibers. As the peptic ulcer patient responds to emotional stress with an overproduction of HCl (a histaminergic reaction), it may be assumed that in his case the histaminergic fibers prevail in the sympathetic structures innervating the stomach. It is suggested that this particular anomaly represents a constitutional predisposition which plays a role in peptic ulcer formation. Two factors have to concur in the development of the disease, the constitutional and the psychogenic. Consequently, treatment of peptic ulcer may be approached in two ways, (a) by removing emotional stress, and (b) by correcting the histaminergic predominance.

TABLE 1. *Gastric acid response of 5 out of 12 dogs to repeated intravenous injections of 100 μg histamine (acidity expressed in degrees). The remaining 7 dogs gave no response*

Time after hourly injections	Dog No. 1		Dog No. 2		Dog No. 6		Dog No. 7		Dog No. 12	
	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound
(Normal)	0	6.6	0	3.0	0	1.0	1.0	4.0	9	20
(1st hour)										
15 minutes	7.0	9.0	4.8	14.4	5.0	5.0	0	3.0	14	25
60 minutes	0	5.0	6.6	14.2	0	3.0	0	3.0	10	15
(2d hour)										
15 minutes	-	-	-	-	16.0	4.0	6.0	4.5	13	13
60 minutes	-	-	-	-	0	1.0	0	2.0	17	14
(3d hour)										
15 minutes	-	-	-	-	4.0	3.0	17.0	2.0	15	11
60 minutes	-	-	-	-	-	-	-	-	9	50

TABLE 2. *Gastric acid response to intravenous injections of histamine after sectioning of cervical spinal cord (acidity expressed in degrees)*

Time after injection	Dog No. 6		Dog No. 13		Dog No. 15		Dog No. 18		Dog No. 19	
	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound
(Normal	0	1.0	0	5.0	0	2.0	0	2.0	0	38.0
(100 μg hist.)										
15 minutes	0	1.0	0	11.4	0	2.0	0	2.0	0	28.0
30 minutes	0	1.0	0	2.0	-	-	-	-	-	-
60 minutes	0	2.0	-	-	-	-	-	-	-	-
(500 μg hist.)										
15 minutes	0	2.0	-	-	0	2.0	0	1.0	0	13.0
(1,000 μg hist)										
15 minutes	-	-	0	6.0	0	1.1	0	2.0	0	5.0

TABLE 3. *Gastric acid response to repeated intravenous injections of 100 μg histamine, following hexamethonium block (10 mg/kg, I. V.) (acidity expressed in degrees)*

Time after hourly injections	Dog No. 6		Dog No. 7		Dog No. 14		Dog No. 15		Dog No. 18	
	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound
(Normal)	0	1.0	2.0	33.0	2.5	3.5	0	8.5	0	1.2
(1st hr)										
15 minutes	0	1.0	0	9.0	0	2.0	0	2.5	0	3.0
60 minutes	0	1.0	0	10.5	0	1.0	0	1.5	0	18.0
(2d hr)										
15 minutes					0	1.2				
60 minutes					0	1.5				
(3d hr)										
15 minutes	Three-hour rest period				0	1.5	Three-hour rest period			
60 minutes					0	1.5				
(4th hr)										
15 minutes					0	3.75				
60 minutes					0	2.5				
(5th hr)										
15 minutes	0	1.0	0	7.0	0	1.0	11.5	18.9	0	26.0
60 minutes	0	1.0	-	-	0	1.0	-	-	-	-
(6th hr)										
15 minutes	0	2.0	1.0	11.0	-	-	10.0	13.0	0	11.0
60 minutes	2.5	0	2.0	35.0	-	-	14.0	4.0	0	14.0
(7th hr)										
15 minutes	18.0	9.0	1.8	7.8	-	-	-	-	2.0	8.0
60 minutes	4.0	2.4	0	1.6	-	-	-	-	0	3.5
(8th hr)										
15 minutes	-	-	7.7	44.0	-	-	-	-	12.0	17.0
60 minutes	-	-	7.5	50.0	-	-	-	-	0	10.0

To test the efficacy of drugs that could be expected to control the neural imbalance, the action of hexamethonium, chlorpromazine, and amphetamine (all neurotropic agents) upon gastric acid secretion was studied. The hexamethonium effect on the histamine-induced HCl response may be attributed to its sympathetic, rather than its parasympathetic, blocking property, as atropine (a parasympathetic inhibitor) is known not to inter-

TABLE 4. *Gastric acid response to repeated intravenous injections of 100 μg histamine, following 5 mg chlorpromazine, I. V. (acidity expressed in degrees)*

Time after hourly injections	Dog No. 6		Dog No. 7		Dog No. 12		Dog No. 15		Dog No. 19		Dog No. 20	
	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound
(Normal)	28.5	3.5	3.0	2.0	0	1.0	0	4.0	2.5	5.0	0	2.0
(1st hr)												
15 minutes	18.0	4.5	1.0	2.0	4.0	4.0	0	3.0	0	15.0	0	4.0
60 minutes	1.0	3.0	0	1.0	0	1.0	0	3.0	7.0	16.0	0	3.0
(2d hr)	1-hr rest period				5-hr rest period		1-hour rest period					
(3d hr)												
15 minutes	19.0	4.0	0	2.0			0	1.0	2.0	4.1	0	3.0
60 minutes	0	3.0	5.0	1.0			0	1.0	6.0	11.0	2.0	4.0
(4th hr)												
15 minutes	0	2.5	1.0	2.0			0	1.5	3.0	7.0	1.0	5.0
60 minutes	-	-	6.0	3.0			-	-	0	2.0	3.0	2.0
(5th & 6th hr)	2-hr rest period						2-hr rest period					
(7th hr)												
15 minutes	2.0	4.5	0	3.0	2.0	3.0	0	2.0	0	6.0	0	4.0
60 minutes	-	-	-	-	0	1.0	-	-	0	2.0	3.6	3.6
(8th hr)												
15 minutes	-	-	-	-	1.0	7.0	-	-	0	4.0	2.0	6.0
60 minutes	-	-	-	-	0	2.0	-	-	0	1.0	12.0	3.0
(9th hr)												
15 minutes	-	-	-	-	0	5.0	-	-	0	2.0	9.0	2.0

fere with that histamine action.[20-22] Hexamethonium, as a nonspecific autonomic ganglionic blocking agent, seems to be of limited therapeutic value; however it should be useful, together with atropine, as a diagnostic aid for the differentiation between histaminergic hyperacidity and cholinergic (food-related) acidity. The finding that chlorpromazine prevented the histamine-induced

gastric acid secretion indicates that this agent is capable of inhibiting central histamine effects, a property which apparently is not shared by other synthetic antihistaminics.[20, 23–25] The drug seems particularly suited for the treatment of peptic ulcer, because as a tranquilizing agent it has the additional advantage of

TABLE 5. *Gastric acid response to repeated intravenous injections of 100 μg histamine, following 2 mg amphetamine, I. V. (acidity expressed in degrees)*

Time after hourly injections	Dog No. 6		Dog No. 7		Dog No. 12		Dog No. 13		Dog No. 15		Dog No. 18	
	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound	Free	Bound
(Normal	16.0	4.5	3.5	3.5	11.0	8.0	0	1.5	0	4.0	0	2.5
(1st hr)												
15 minutes	17.5	5.0	10.0	4.5	17.0	9.0	0	1.0	0	4.0	0	3.5
60 minutes	3.0	4.0	0	10.0	10.0	4.0	1.5	2.0	0	3.0	0	2.0
(2d hr)												
15 minutes	6.0	5.0	2.0	6.0	10.0	4.0	0	1.0	0	7.0	7.0	3.0
60 minutes	3.0	6.0	-	-	11.0	5.0	1.0	1.0	0	1.5	0	1.0
(3d hr)												
15 minutes	9.0	5.0	10.0	15.0	3.0	3.0	0	2.4	1.4	8.4	0	2.0
60 minutes	2.0	3.0	12.0	5.0	6.0	2.0	0	1.0	0	1.5	0	2.0
(4th hr)												
15 minutes	2.0	2.0	17.0	3.0	9.0	3.0	1.0	2.5	0	14.0	3.0	2.0
60 minutes	3.6	2.4	13.5	3.0	6.0	2.0	0	0.5	0	2.0	0	1.0
(5th hr)												
15 minutes	2.5	2.5	15.0	3.0	6.0	7.0	0	1.5	0	1.5	0	3.0
60 minutes	0	2.0	7.0	4.0	1.0	1.0	3.0	3.0	0	2.0	0	1.0
(6th hr)												
15 minutes	0	2.0	4.0	2.0	6.0	5.0	-	-	0	2.0	0	2.0
60 minutes	4.0	5.0	-	-	5.0	5.0	-	-	0	1.0	0	2.0
(7th hr)												
15 minutes	5.5	3.5	-	-	20.0	5.0	-	-	0	3.0	0	1.0
60 minutes	-	-	-	-	-	-	-	-	-	-	-	-

reducing the adverse psychogenic stimulation. Amphetamine, an adrenaline congener, was studied as it could be expected, due to its sympathomimetic properties, to prevent the histamine effect upon the gastric glands by depressing their activity.[26–29] The experimental results obtained with amphetamine give indica-

tion of its usefulness as a therapeutic agent in peptic ulcer, particularly, as it is known to have potent mood-elevating properties and thus may alleviate the emotional stress as well.

SUMMARY

The mechanism by which histamine provokes gastric acid secretion was studied in the dog. It was found that the histamine-induced gastric acid response can be abolished (a) by sectioning of the preganglionic sympathetic fibers and (b) by autonomic ganglionic blockade with hexamethonium. It was postulated that the sympathetic structures innervating the stomach carry histaminergic as well as adrenergic fibers and that the constitutional predisposition for peptic ulcer consists in a predominance of the histaminergic fibers. Based on clinical evidence, it was concluded that for the development of the disease in man a psychogenic factor has to concur with the constitutional anomaly. Chlorpromazine and amphetamine were tested and found to effectively control histaminergic acid formation. Their possible therapeutic indication was discussed.

ACKNOWLEDGMENT: The authors are grateful to John A. Jereb and Lawrence F. Sancilio for their technical assistance.

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SPECIAL-CARE WARD FOR CRITICALLY ILL SURGICAL AND POSTOPERATIVE PATIENTS

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A SPECIAL ward for the care of postoperative patients, and of those surgical patients who are seriously ill, require complicated care, or need close observation, serves a useful purpose for patients and staff alike. Such a ward has been in operation for several years both at this hospital and at the U. S. Army Hospital, Fort Belvoir, Va. Nursing service is provided 24 hours a day by graduate nurses and enlisted technicians who are especially trained in care of the tracheotomy patient; intravenous therapy; oxygen therapy; nasogastric suction; use of respirators, chest drainage tubes and bottles, and urinary catheters; noting and recording stages of consciousness, signs of anoxia, shock, fluid intake and output; and many other vital procedures. Much special equipment is available on the ward, including facilities for oxygen administration by mask, catheter, or tent; measuring oxygen concentration; suction; artificial respiration by means of automatic positive pressure oxygen operated apparatus; Wangensteen suction and chest suction pumps; shock blocks; laryngoscope; bronchoscope; and various trays for use in performing a tracheotomy, placing chest drainage tubes or carrying out intravenous or urethral catheterization.

The same ward is used for all patients, whether male or female, adult or child. Our particular floor plan has four large interconnecting rooms near the operating suite and x-ray department, which are useful for segregating male, female, and pediatric patients. Each bed may be screened with curtains hung on an overhead wire, for privacy. More substantial cubicles would make for more difficult observation.

Patients are formally admitted to and retained on the census of a "home" ward, but are kept on the special-care ward in a "boarder" status. Postoperative patients are routinely put on this ward for the postanesthesia recovery period, and those requiring little care, as after herniorrhaphies or appendectomies, are returned to their "home" ward the same afternoon. However,

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patients requiring Wangensteen suction, chest drainage, or tracheotomy care are kept on the special-care ward as long as need for this care exists. Those with head injuries and other serious injuries are immediately put on the special-care ward where observation, maintenance of an airway, et cetera, can be carried out properly. Fluid intake and output, state of consciousness, blood pressure, temperature, pulse, respiration, and other observations are recorded on the patient's chart at the foot of the bed, where they are freely accessible at all times.

The special-care ward is headed by a well-qualified surgeon who is responsible for all patients. The anesthesiologist sees all postoperative patients and supervises postanesthetic care; ward surgeons from other wards are encouraged to see and follow their cases; each surgeon writes his own postoperative orders; and patients who have been operated on because of orthopedic, urologic, eye, ear, nose, throat, or gynecologic conditions are treated by the respective services; but it is essential that one surgeon have over-all responsibility for the ward.

During the past year, about 1,000 acutely or seriously ill and 4,000 postoperative patients have benefited by the facilities of the special-care ward at this hospital. During the same period, approximately 400 patients with head injuries, 200 in traumatic shock, 8 with severe gastrointestinal bleeding, and 20 with severe burns were admitted directly to the ward. About 30 tracheotomies were performed on patients with head injuries and severe maxillofacial and cervical trauma. Emergency artificial respiration with intratracheal intubation was carried out on 5 patients. Intravenous cutdowns for polyethylene tubing were done in many cases. Emergency chest drainage was carried out 24 times in patients with traumatic or spontaneous pneumothorax. Immediate aftercare of two patients who received massage for cardiac arrest was accomplished, with survival of both.

Because of the increasing shortage of nurses, all wards cannot be completely staffed by nurses, especially at night. By concentrating those patients needing a great amount of nursing care on one ward, as was proposed by Beardsley, Bowen, and Capalbo,[1] isolated patients requiring such care are brought where they can get it. Due to early ambulation, within 24 hours unless contraindicated for a specific reason, patients usually are at least partially ambulant when sent to their own wards, and can assist in their own care. Dressings are removed from most nondrained wounds after 24 hours. This makes for drier, less irritated wounds, better wound observation, better patient mobility, and minimized dressing procedures on other wards.

Advantages of the special-care ward include:

1. Expert professional care, as well as special equipment and knowledge of its use are always immediately available to those who need them.

2. Close observation of the critically ill surgical patient and recording of important facts are reliably carried out.

3. Danger that a remote case might be neglected as a result of shortage of professional help is obviated.

4. Professional help may be safely spread thinner on other wards.

5. Need for special nurses or attendants for the individual patient is obviated.

A separate anesthesia recovery ward is desirable in large hospitals, if staffing is possible, while the combined type of ward is recommended for the average hospital where expert and adequate staffing of every ward is out of the question. I am convinced that the facilities of our special-care ward have saved many lives, prevented many complications, saved the time of professional personnel, and contributed to the smooth and uneventful recovery of the average surgical patient.

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NONTUBERCULOUS CHEST CASES ORIGINALLY DIAGNOSED AS TUBERCULOUS

A Five-Year Study

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BURKE AND WIER[1] reviewed the nontuberculous cases originally admitted to the tuberculosis service at this hospital in the years 1952 through 1954 and compared this study with similar observations made at another institution some years previously.[2] Their original series of cases has been expanded and brought up to date, so that our present series now covers dispositions from this hospital for the period 1952 through 1956. Insofar as possible, the cases included in the earlier series have been reviewed and certain minor alterations made so that the criteria used in compiling the figures for 1952 through 1954 are the same as those used for 1955 and 1956.

The current discussion is limited to patients in whom a chest abnormality was demonstrated roentgenographically, or in whom other evidence pointed to a chest lesion that was originally diagnosed as either definitely or possibly tuberculous and for which the patient was admitted to the tuberculosis service upon his arrival at this hospital. Certain cases in which the patients had normal chest roentgenograms are included in this study. These mainly fall into the "no pulmonary disease found" final diagnosis group, and include errors in roentgenographic interpretation as well as a fairly good-sized group in whom positive bacteriologic findings were reported without any evidence of pulmonary disease. This group will be discussed at greater length farther on in this article.

Exclusive attention will be paid to those conditions that tend to be confused with pulmonary tuberculosis. No consideration will be given to other significant conditions such as diabetes, orthopedic conditions, arteriosclerosis, psychiatric disturbances, and gastrointestinal diseases, which, in some instances, were much more bothersome to both the patient and to the physician than a questionable chest lesion that ultimately proved to be nontuberculous.

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This series includes only patients admitted to the tuberculosis service in whom tuberculosis was not confirmed. It does not include those admitted to other services who eventually turned out to have tuberculosis, or tuberculous patients in whom the error was not one of diagnosis but rather of poor follow-up resulting in avoidable spread of the disease and resulting tragedy to the patient and his contacts. Nontuberculous patients in whom errors of diagnoses occurred are not included unless their original admission to this hospital was for tuberculosis or possible tuberculosis.

With these definitions and qualifications, we can now proceed with an analysis of our findings and discussion of trends apparent over five years of observation.

ANALYSIS AND FINDINGS

Table 1 compares the total dispositions of patients from the tuberculosis service with the number originally admitted with a diagnosis of tuberculosis or possible tuberculosis in whom a final nontuberculosis diagnosis was given. Out of a total of 5,324 dispositions during the five-year period, 851 such cases were found, an over-all incidence of 16 per cent. It is significant to

TABLE 1. *Percentage of total patients discharged from tuberculosis service from 1952 through 1956 who were admitted with a diagnosis of tuberculosis or possible tuberculosis but whose final diagnosis was a nontuberculous condition**

	Dispositions		
	Total	Patients with non-tb**	Per cent
Total	5,324	851	16.0
1952	1,315	233	17.7
1953	1,158	204	17.2
1954	949	156	16.4
1955	979	137	14.0
1956	923	121	13.2

*Patients admitted with diagnosis of extrapulmonary or possible extrapulmonary tuberculosis (*e. g.*, superficial lymph node tuberculosis or bone tuberculosis), whose final diagnosis was a nontuberculous condition have been excluded from this series.

**Refers to intrathoracic lesions only.

note, however, that there has been a steady decline in the percentage of such admissions over each of the five years, starting with 17.7 per cent in 1952 and ending with 13.2 per cent in 1956. This would reflect an over-all increase in diagnostic acumen on the part of the referring physicians and probably indicates better and more complete initial study of patients with chest diseases. There seems to be an increasing awareness of nontuberculous chest diseases, accompanied by a decreasing inclination to call any obscure chest lesion tuberculosis.

Table 2 shows the final diagnoses in order of frequency in the 851 patients originally admitted to the tuberculosis service who had ultimate nontuberculous diagnoses at discharge. It will

TABLE 2. *Fifteen leading nontuberculous chest diseases, in order of frequency, originally diagnosed as tuberculosis, 1952-1956*

Disease	Number of patients	Per cent
Fibrosis, cause undetermined	126	14.8
Pneumonia	88	10.3
Histoplasmosis	79	9.3
Bronchiectasis	66	7.8
Coccidioidomycosis	56	6.6
Pleurisy	48	5.6
Granuloma, cause undetermined	38	4.5
Sarcoidosis	36	4.2
Neoplasm of lung, primary	29	3.4
Bronchitis	20	2.3
Abscess of lung	16	1.9
Emphysema, pulmonary	15	1.8
Pulmonary embolism with infarction	12	1.4
Pneumothorax, spontaneous	10	1.2
Hemoptysis, cause undetermined	10	1.2
Total	649	76.3
Remaining miscellaneous nontuberculous chest diseases (33 nontuberculous conditions)	91	10.8
No pulmonary disease	95	11.0
Undiagnosed lesions	16	1.9
Grand total	851	100.0

be noted that these 15 conditions account for over three fourths (76.3 per cent) of the entire series. An additional 11 per cent had no pulmonary disease. In 1.9 per cent, no satisfactory diagnosis was ever established, but these cases were presumed to be nontuberculous. The remaining 10.8 per cent, consisting of 91 cases, were divided among 33 other categories. Many of these were extremely interesting as individual cases but so infrequently encountered that they do not indicate diagnostic

trends. Because space will not permit elaboration on every category of diagnosis, these 91 cases will be passed over with no more mention than notation in the tabulation of discharge diagnoses (table 3).

Most of the remaining part of this article will be devoted to a detailed analysis of the 15 most common discharge diagnoses and the group in whom no pulmonary disease was confirmed. Together, these two categories account for 744 out of our 851 cases, or 87.3 per cent of the series. Individual categories of discharge diagnosis will be discussed in order of frequency of the top 15 conditions over the five-year period followed by discussion of the "no pulmonary disease" group.

PULMONARY FIBROSIS AND/OR CALCIFICATION, CAUSE UNDETERMINED

Pulmonary fibrosis and/or calcification, cause undetermined, is admittedly a wastebasket diagnosis in which 126 cases (14.8 per cent) are included. For the most part, these patients showed localized fibrosis with stable lesions, often demonstrable over long periods. These lesions were usually considered clinically insignificant and not of an extent to justify biopsy. Cultures for *Mycobacterium tuberculosis* were obtained routinely and were negative at this installation, although some of these patients were originally admitted with a report of a single positive smear or culture which was unconfirmed and considered erroneous in the light of subsequent study. Many of these persons had negative tuberculin skin tests. The importance of tuberculin testing and the "false positive" bacteriologic tests will be discussed in greater length later in this article.

There is no doubt but that some of the lesions included in this group really represent clinically insignificant, healed, minimal tuberculosis residuals.

It is significant to note the steady decline in the frequency of this diagnosis. In 1952, 40 out of 233 cases, or 17.5 per cent, were given this final diagnosis. In 1956, only 6.6 per cent, or 8 out of 121 cases, ended up in this category. This trend can probably be explained by one or more of the following factors: (1) improved diagnostic technics; (2) willingness to make a diagnosis of fungus infections, especially histoplasmosis, on the basis of history, roentgenographic appearance, and skin and serologic tests, without confirmation by surgery; (3) increasing awareness of other conditions, such as pulmonary infarction, that can produce pulmonary fibrosis; and (4) the policy, during the period of this study, of routinely returning military personnel with inactive tuberculosis to a duty status.

At the present time, we have no great hesitancy about making a diagnosis of minimal inactive tuberculosis and clearing the

TABLE 3. *Nontuberculous chest diseases in 851 patients originally diagnosed as tuberculosis, 1952-1956*

Discharge diagnosis	Total	1952	1953	1954	1955	1956
Total	851	233	204	156	137	121
Infection and sequelae						
Fibrosis and/or calcification, pulmonary, cause undetermined	126	40	37	27	14	8
Pulmonary mycotic and parasitic disease						
Coccidioidomycosis	56	28	10	7	5	6
Histoplasmosis	79	16	18	15	12	18
Cryptococcosis	1	-	-	-	-	1
Other fungi	2	-	2	-	-	-
Schistosomiasis	1	-	-	1	-	-
Paragonimiasis	1	1	-	-	-	-
Bronchiectasis	66	24	16	11	10	5
Pneumonia	88	34	15	13	17	9
Pleurisy	48	7	6	13	11	11
Bronchitis	20	3	3	4	4	6
Abscess, lung	16	3	1	6	5	1
Broncholithiasis	1	-	-	1	-	-
Lymphadenopathy, mediastinal	3	3	-	-	-	-
Emphysema, pulmonary	15	3	3	3	4	2
Empyema	3	-	2	1	-	-
Granuloma, cause undetermined	38	-	11	7	14	6
Pericarditis (all nontuberculous types)	4	-	3	-	1	-
Pneumoconiosis (silicosis)	6	3	3	-	-	-
Tumors and cysts						
Neoplasm, lung, primary	29	4	10	8	2	5
Carcinoma, metastatic	1	-	-	-	1	-
Lymphoma	1	-	-	-	1	-
Bronchogenic cyst	4	1	3	-	-	-
Cyst of lung	5	-	1	2	2	-
Osteoma and osteochondroma, ribs	1	-	-	-	1	-
Soft tissue tumors, chest wall lipoma, fibroma, et cetera	1	-	-	-	-	1
Allergic disorders	7	1	1	1	4	-
Congenital anomalies and structural changes						
Achalsia, esophagus	1	1	-	-	-	-
Pneumothorax, spontaneous	10	3	3	-	1	3

TABLE 3. *Nontuberculous chest diseases in 851 patients originally diagnosed as tuberculosis, 1952-1956*—Continued

Discharge diagnosis	Total	1952	1953	1954	1955	1956
Congenital anomalies and structural changes—Continued						
Undiagnosed lesion, probably due to agenesis	1	-	-	1	-	-
Fibrocystic disease (cystic bronchiectasis)	2	-	-	-	-	2
Trauma						
Hematoma, lung	6	5	1	-	-	-
Fibrosis of pleura	2	1	1	-	-	-
Fractured ribs with traumatic pneumonitis	2	-	1	-	-	1
Hemothorax, or effusion due to trauma	2	-	-	1	-	1
Foreign bodies aspiration						
Lipoid pneumonia	3	1	1	-	1	-
Foreign body, endobronchial, retained	1	1	-	-	-	-
Blood, vascular, and circulatory disorders						
Pulmonary embolism with infarction	12	4	-	1	2	5
Vascular anomaly	2	1	1	-	-	-
Hemoptysis, cause undetermined	10	2	3	2	1	2
Disease of unknown cause						
Sarcoidosis	36	1	5	12	8	10
Xanthomatosis	1	-	1	-	-	-
Eosinophilic pneumonopathy	3	-	-	3	-	-
Artifacts, extrinsic shadows	1	-	1	-	-	-
Collagen diseases						
Periarteritis nodosa	1	-	-	-	1	-
Lupus erythematosus disseminatus	1	-	-	-	1	-
Combined lesions						
Inactive tuberculosis with other pulmonary disease	8	7	-	-	1	-
Inactive tuberculosis with extrapulmonary nontuberculous disease	12	4	7	-	1	-
Unclassified and other lesions						
Observation, medical, pulmonary disease, none found	95	31	22	12	12	18
Undiagnosed lesions	16	-	12	4	-	-

patient for continued duty, whereas formerly such a diagnosis might have unjustly interfered with a man's career and future. In such cases, in earlier years, the inclination would have been to give the man the benefit of the doubt and make some other diagnosis, such as pulmonary fibrosis, because clinically significant tuberculosis could not be proved.

PNEUMONIA

Pneumonia proved to be the cause of pulmonary lesions in 10.3 per cent of our cases. The range has been 14.6 per cent in 1952, 12.4 per cent in 1955, and 7.4 per cent in both 1953 and 1956. Thus, we have no consistent trend over the past five years. These variations probably depend on the incidences of respiratory infections year by year and locality by locality. It is to be noted that upper-lobe pneumonias, especially those of the viral type, can mimic the roentgenographic findings of tuberculosis. It may take many weeks or even a few months to clear a pneumonic infiltration completely. Occasionally, false positive sputum cultures are obtained or transiently positive ones develop as a result of inflammatory erosion of an old tuberculous focus into a bronchus. When such a situation arises, it is easy to see how legitimate confusion can result. Friedländer pneumonia can look like an acute caseous pneumonic process, even showing cavitation on the roentgenogram. *Klebsiella pneumoniae* may easily be missed in the sputum unless specifically suspected and looked for.

Pneumonias not infrequently show uneven resolution, leaving pseudocavities which may be radiologically indistinguishable from tuberculosis on conventional roentgenograms. Undoubtedly, there will always be a certain residual of cases in which the differential diagnosis cannot be made in a reasonable time with the facilities available at the installation originally seeing the patient. In such a case, an initial admission diagnosis of possible tuberculosis will probably remain justified.

If certain points are remembered, however, some unnecessary diagnoses of tuberculosis, with the attendant trauma and anxiety that this diagnosis always brings, can be eliminated.

1. Every infiltration in the upper lobe is not necessarily caused by tuberculosis.

2. A reasonable period of observation under appropriate nontuberculous chemotherapy will frequently give many answers.

3. A negative tuberculin skin test adequately done with freshly prepared PPD and repeated on several occasions will, for all practical purposes, exclude the diagnosis of tuberculosis.

4. A patient with an acute tuberculous pneumonic process will usually have sputum which is strongly positive for *Myco.*

tuberculosis. Adequately examined and cultured sputum specimens, which are repeatedly negative, would argue very strongly against a diagnosis of tuberculosis.

5. In some instances, the more uncommon pneumonias, such as Friedländer pneumonia, should be borne in mind.

HISTOPLASMOSIS

The diagnosis of histoplasmosis is being made with increasing frequency. The five-year average has been 9.3 per cent, increasing year by year from 6.8 per cent in 1953 to 14.9 per cent in 1956. For the year 1956, histoplasmosis held first place in the list of final diagnoses of nontuberculous patients admitted to the tuberculosis service as definite or possible tuberculosis. The chances are that it will remain near the top of the list until awareness of the great differential diagnostic importance of histoplasmosis is a matter of common knowledge.

In early years, biopsy, positive fungus cultures, or high serologic titers were considered necessary to establish this diagnosis. Today we are making the diagnosis more and more on the basis of history, positive skin tests, and roentgenographic findings, especially if the tuberculin is negative.

Coin lesions with definite "target" calcifications or diffusely scattered fine pulmonary calcifications are characteristic of histoplasmosis, and in the presence of a positive skin test we are inclined to make this diagnosis without biopsy. We believe that the histoplasmin skin test is very specific for this disease. However, we believe that it is very important that the same syringe is never used for both tuberculin and histoplasmin, inasmuch as residual contamination can produce false positives in either direction. Occasional cross reactions with coccidioidin and blastomycin have been observed.

There is no doubt that in the past many patients were given treatment for tuberculosis when, in reality, they had histoplasmosis. Many of the large number of "pulmonary fibrosis and/or calcification, cause undetermined" cases of the earlier years would probably be considered as histoplasmosis today. However, diagnostic difficulties will remain in those patients in whom the roentgenographic findings are not typical and in whom the tuberculin and/or coccidioidin as well as the histoplasmin skin tests are positive.

There will always be patients who have round foci without calcification but who have a positive reaction to the histoplasmin skin test and no documentation as to how long the lesion might have existed. In these cases, of course, thoracotomy for diagnostic purposes continues to be indicated to establish a differential diagnosis between tuberculosis, tumors, histoplasmosis,

or other diseases caused by fungi. An occasional case will prove to be histoplasmosis in the presence of a negative reaction to histoplasmin. Therefore, unlike the tuberculin skin test, a negative reaction to the histoplasmin skin test does not exclude histoplasmosis with certainty.

BRONCHIECTASIS

The trend has been a decrease, year by year, in the number of cases of bronchiectasis misdiagnosed as tuberculosis. Certain factors probably explain the increasing frequency of bronchiectasis as a primary diagnosis and, therefore, the decreasing frequency of original misdiagnosis.

1. Awareness that this condition may occur in the upper lobe as cystic bronchiectasis, probably on a congenital basis, or that it may be present as a result of an old or recent bronchoocclusive lesion followed by infection. The roentgenographic findings in such cases can frequently be confused with those in tuberculosis.

2. More routine use of careful skin testing.

3. Awareness of bronchiectasis as a common cause of hemoptysis.

4. More careful history and physical examination, especially the observation of an area of persistent localized rales.

5. Increased routine use of bronchoscopy and bronchography.

Even after taking all of the above factors into consideration, there may be many times when the differential diagnosis is difficult from a roentgenographic point of view. In such cases, the presence of a positive tuberculin skin test and/or a false positive sputum or gastric culture will lead to a very legitimate presumption of tuberculosis.

Thus, we believe that a certain number of patients with bronchiectasis will probably continue to be admitted with their disease diagnosed as possible tuberculosis, no matter how careful the original studies. Careful attention to the various factors outlined above should keep the incidence of this particular diagnostic error to a minimum.

COCCIDIOIDOMYCOSIS

The number of cases of coccidioidomycosis originally considered as tuberculosis dropped sharply after 1952. Some of this may be due to improved primary diagnosis of coccidioidomycosis. Other case undoubtedly were included in the granuloma, cause undetermined, group.

Because coccidioidomycosis frequently causes cavitary lesions, it may easily be confused with tuberculosis. In this con-

nection, it is wise to remember that the coccidioidomycosis cavity frequently, though not invariably, tends to be thin-walled and that pericavitary reaction is usually much less marked than in tuberculosis. However, coccidioidomycosis can produce infiltrations which roentgenographically are indistinguishable from tuberculosis, and visa versa.

In this disease, the skin test is not as specific as in either histoplasmosis or in tuberculosis. There is a sizable percentage of patients eventually proved to have coccidioidomycosis who have negative skin tests, at least in the usual 1:100 dilution, although some of these will be positive at 1:10 dilution. A patient with a reaction negative to coccidioidin and positive to tuberculin, and with roentgenographic findings compatible with tuberculosis, will, therefore, continue to be considered as tuberculosis on initial evaluation. Even if the reaction to coccidioidin is positive, if the reaction to tuberculin is also positive, and the roentgenographic findings could be compatible with either, there is a legitimate reason to consider tuberculosis until proved otherwise.

The following considerations might help to reduce the incidence of erroneous diagnosis of tuberculosis in cases of coccidioidomycosis.

1. The endemic areas comprise a large part of the Southwestern United States. Thus, not only is this disease endemic in the San Joaquin Valley, but also in large parts of southern California, Arizona, New Mexico, and west Texas. Many military and Air Force personnel are stationed in this endemic area or will give a history of having been stationed there at some time in their career. In virtually every proven case of coccidioidomycosis, a history of having at least visited in an endemic area can be obtained.

2. The coccidioidin skin test, although imperfect, should be routinely used as this will point the finger of suspicion at a majority of cases and at least indicate this condition as a definite diagnostic possibility.

3. Serologic studies and complete physical examinations should be done in all suspicious cases. There may be a normal titer found either in the very early acute case or in the old case with chronic residuals. Serial agglutination studies are often important and significant serial changes in titer may be diagnostic in suspected lesions.

4. Sputum and/or gastric specimens may often be positive for *Coccidioides immitis,* especially in cavitary cases. Fungus cultures and mouse inoculations should, therefore, be done in all suspected cases.

5. Any cavitary lesion which fails to reveal *Myco. tuberculosis* on repeated examinations, should make one suspicious that the disease might be something other than tuberculosis.

6. Diagnostic thoracotomies will continue to be necessary in a fair number of cases. *C. immitis* spherules should be routinely looked for in all resected granulomatous lesions.

PLEURISY

The diagnosis of tuberculous pleural effusion admittedly is usually inexact. In most cases, no pulmonary infiltration is ever found and no bacteriologic proof is ever obtained. Because of the high relapse rate in untreated tuberculous effusion, and the fact that significant pulmonary disease almost never develops following adequate chemotherapy of a tuberculous effusion, we would much rather treat some patients unnecessarily than overlook any significant cases.

Primary pleural *effusion* of unknown cause in patients who have a positive reaction to tuberculin, either on admission or after several weeks of observation, is presumed to be tuberculous. These patients are given a course of chemotherapy.

Most patients not fitting the above criteria can be eliminated prior to transfer to a tuberculosis center if careful attention is paid to the following: (1) *Primary* means without other apparent cause. Acute respiratory infections, especially pneumonia, may produce pleural effusions. Pulmonary emboli, tumors, trauma to the ribs or chest wall, uremia, cardiac failure, collagen disease, and virus infections are some of the other conditions which cause pleural effusions. Every effort should be made to establish a definitive diagnosis in all cases, if possible. This should include thoracentesis during the acute phase with careful bacteriologic and cytologic examination of fluid. (2) *Effusion* means that the patient has fluid. Occasionally an effusion may develop which is evanescent, showing complete clearing after a few days or a couple of weeks. This is distinctly unusual behavior for an untreated tuberculous effusion and should arouse suspicion as to some other cause. Each year, we see a number of patients in whom there is no effusion but evidence of old pleural thickening with obliteration of a costophrenic sulcus. In most of these patients, old roentgenograms are eventually obtained which show this to be a remote process and an old and unchanging lesion. A little thought and patience in obtaining old films would eliminate most of these cases. (3) If a patient with a pleural effusion is negative to freshly prepared PPD, and if he remains negative after 60 to 90 days on repeat test, tuberculosis can be eliminated as a cause of the effusion.

GRANULOMA, CAUSE UNDETERMINED

Some of these cases represent patients in whom it was believed that tumor was excluded clinically and tuberculosis was excluded on the basis of persistently negative tuberculin tests, but in whom both coccidioidin and histoplasmin were positive and, therefore, no clinical differential diagnosis could be made. Thoracotomy was not believed to be indicated in some of the patients because of the limited extent of the lesion and the proven stability of the process. In others, thoracotomy was advised for diagnosis but refused by the patient.

In many of these cases, however, surgery was performed and no definitive diagnosis was made. It is interesting to note that in 1952 there was no case in which a final diagnosis of granuloma was made. A relatively high incidence was found in 1953 and in 1955. A lower incidence of this diagnosis was obtained in 1954 and 1956. These wide swings are probably, in part at least, explained on a local situation at this hospital and could be ascribed to personnel changes in the pathology and bacteriology departments and individual differences in willingness to commit oneself to a positive diagnosis if any element of doubt exists.

All granulomas should be diligently examined by tissue sections with appropriate staining as well as by smear and by cultures for both fungi and *Myco. tuberculosis*. In spite of the most painstaking investigation, the pathologist is bound to run across an occasional case in which he simply cannot make an etiologic diagnosis. The fact that no such case was found in 1952 seems to be either sheer good luck or an exceptional degree of skill on the part of the pathologist, or maybe a little of both. On the other hand, the 14 cases so diagnosed in 1955 might signify a run of difficult cases, unwillingness on the part of the pathologist to commit himself if he had the least doubt, or a deficiency in technic.

Probably the 1954 and 1956 figures represent the usual batting average for this diagnosis.

SARCOIDOSIS

The discharge diagnosis of sarcoidosis is being made with generally increasing frequency in the last three years as compared with the first two years of this study: again, probably because of an increasing awareness of its existence and the increasing use of surgical biopsy, including diagnostic thoracotomy in suspected tuberculous cases and in suspected mediastinal tumor masses.

Sarcoid is often said to be predominantly a disease of the Negro, although it is not infrequent in Caucasians. Nodular lung lesions and bilateral hilar adenopathy are the most common thoracic

manifestations. Pulmonary infiltrations tend to be diffuse, linear, and nodular in nature and can be roentgenographically confused with miliary or other extensive forms of pulmonary tuberculosis, tumors, or lymphomas.

Most often the patient is not as clinically ill as his roentgenogram might suggest. The shadows on the roentgenogram are frequently evanescent and can show rapid spontaneous clearing or increase with no apparent cause.

Great caution should be exercised in making this diagnosis in the presence of a positive tuberculin test, although a negative test is not a prerequisite and many of our patients have shown a positive reaction to tuberculin. In these cases, the diagnosis was made on clinical and roentgenographic grounds, the course of the patient, and most importantly on the basis of repeated biopsies.

It is admittedly possible that the final diagnosis may eventually prove to have been in error and that some of these may actually represent forms of tuberculosis or fungus disease.

Biopsy should be done in all suspected cases, and the diagnosis of sarcoidosis probably should never be made in the absence of positive biopsy findings, because the differential diagnostic possibilities, of both tuberculous and nontuberculous conditions, are usually too serious to permit error.

With the possible exception of the inguinal nodes, any enlarged peripheral node should be removed for biopsy. If there is no peripheral adenopathy, a supraclavicular fat-pad biopsy should be done as this is a fertile field for finding positive diagnostic tissue. If neither of the preceding gives the answers, a diagnostic thoracotomy with lung or mediastinal node biopsy should be done. The risk of this procedure is small and certainly much less than the risk of overlooking a much more serious disease.

The characteristic pathologic finding is a noncaseating granuloma. If caseation and necrosis are found, considerable doubt is thrown on the validity of a diagnosis of sarcoidosis. Of course, appropriate studies should be done on all biopsy material to rule out possible tuberculous or fungus infection.

Most of the above-mentioned studies usually can be carried out at the installation originally seeing the patient, and if awareness of pulmonary sarcoid is high, it should be possible to reduce the incidence of sarcoid cases hospitalized with the diagnosis of tuberculosis or, indeed, called tumor or lymphoma on the basis of an original examination.

NEOPLASM OF LUNG, PRIMARY

It is noteworthy that the category neoplasm of lung, primary, holds ninth place in the five-year total of lesions originally

considered as tuberculous. Partially, this may be due to the generally younger age group encountered in the military so that, in general, incidence in the armed services as a whole is probably less than in the adult civilian populations. To a great extent, however, the relatively low place on the list must be due to an increased awareness of the common occurrence of lung tumors on the part of the profession in general. Exploratory thoracotomy is being performed promptly in suspicious cases, especially in lesions in the 40-year and over age groups.

We occasionally encounter tumors, however, which roentgenographically so closely resemble tuberculosis that a certain error in primary diagnosis will continue to occur. At times, a tumor may erode an old tuberculous focus and produce a misleadingly positive bacteriologic test. Some tumors may cavitate; in these instances, absence of readily demonstrable positive sputum should cause suspicion that the lesion is something other than tuberculous. Uncalcified round foci that are not documented as having been present over a long period of time should all be surgically removed. If a tumor is beyond the limits of bronchoscopic visibility and if no ulceration into the bronchial system has occurred, bronchoscopy and cytology of bronchial washings will be negative, even in highly malignant lesions. Therefore, negative bronchoscopy and bronchial washings for tumor cells do not exclude the possibility of tumor, although these studies are indicated in all suspicious lesions.

Supraclavicular fat-pad biopsy is useful if extension beyond the lung has occurred. In most cases, however, exploratory thoracotomy remains necessary to prove or disprove the possibility of neoplasm. A continued high level of suspicion with early exploration in any case where the possibility of tumor is even seriously considered will help to raise the gloomy salvage statistics in cancer of the lung.

In suspicious cases where tuberculosis is also a good differential possibility, the patient can be given a short course of intensive antituberculous chemotherapy for a period of from 10 days to 3 weeks prior to thoracotomy.

BRONCHITIS

Each year, a few patients with acute or chronic bronchitis are admitted as possibly having tuberculosis. Persistent coughing, sputum, and even hemoptysis might be the reason for suspecting tuberculosis. Frequently, a false positive sputum is noted, leading to admission. Roentgenographic findings are indefinite and usually no more than increased markings or peribronchial fibrosis is noted. Severe symptoms without definite roentgenographic changes should make one more suspicious of bronchitis or bronchiectasis than of pulmonary tuberculosis. Adequate work-

up, including bronchoscopy, bronchography when indicated, and careful and complete evaluation should be done in all cases.

ABSCESS OF LUNG

The few cases of abscess of the lung confused with tuberculosis can be practically eliminated by careful history taking, especially if recent evidence of pneumonitis or aspiration is looked for. Careful physical examination, including observations regarding fever, systemic manifestations, and the type and amount of sputum, must be carried out. The roentgenogram usually shows a cavitary lesion, which may be thin or very thick-walled. Usually there is less pericavitary infiltration in abscess of the lung than in tuberculosis. Sputum should be cultured routinely and carefully for pathogens as well as for *Myco. tuberculosis* and fungi. A cavitary lesion with copious sputum in which acid-fast bacilli are not readily demonstrable should cause early suspicion that the patient has something other than tuberculosis, and further study should elicit the proper diagnosis.

EMPHYSEMA, PULMONARY

Pulmonary emphysema is occasionally confused with tuberculosis, especially localized obstructive emphysema with blebs suspicious of cavitation. The roentgenographic findings are usually somewhat different from those in tuberculosis, although in some patients associated fibrosis may make the differential diagnosis very difficult. Adequate roentgenographic studies, including careful fluoroscopy for evidence of obstructive phenomena, and tomography are useful in differentiating these conditions. Of course, tuberculin testing and careful bacteriologic studies should be done in all cases in which tuberculosis enters into the differential diagnosis.

Pulmonary function studies at times may be quite helpful.

PULMONARY EMBOLISM WITH INFARCTION

Pulmonary embolism with infarction has been diagnosed with increasing frequency in recent years in patients admitted supposedly as having tuberculosis. This would seem to indicate increasing awareness of this condition by the personnel on the pulmonary disease service at this hospital. Careful attention to the history and careful examination, especially of the legs, for any evidences of thrombophlebitis are important. A history of acute onset with sudden chest pain and cough, with or without hemoptysis, should make one suspicious. Characteristic roentgenographic findings with wedge-shaped infiltrations resolving rapidly without definite treatment would point to this diagnosis.

Acute pleural effusion, especially if bloody, which comes on suddenly and clears rapidly is more suggestive of pulmonary embolus than tuberculosis. More critical evaluation of the patient

and more careful follow-up for evidences of rapid clearing of suspected lesions should hold this source of misdiagnosis to a bare minimum.

PNEUMOTHORAX, SPONTANEOUS

A few cases of spontaneous pneumothorax are seen each year as possible tuberculosis. The older teaching was that tuberculosis was a common cause of this condition, but current information shows that rupture of subpleural emphysematous blebs having nothing to do with tuberculosis is the cause in the great majority of cases. Only a very rare case is the result of tuberculosis. Frequently fluid is apparent after a spontaneous pneumothorax. This may be either bloody or serous depending on how much hemorrhage there has been into the pleural cavity. This is not a primary effusion and if documented as having its onset during or following a spontaneous pneumothorax, the presumption of tuberculosis does not exist, even should the patient have a positive tuberculin test.

HEMOPTYSIS, CAUSE UNDETERMINED

"All that spits blood is not tuberculosis." This "wastebasket" diagnosis covers those few cases in which, after tuberculosis and other conditions such as tumors, bronchiectasis, bronchitis, heart disease, vascular anomaly, local upper respiratory lesions, pulmonary infarction, et cetera, have been excluded, we are left with no good explanation as to why the patient has had a hemoptysis. Most of these cases are legitimately admitted as suspected of having tuberculosis, and the final diagnosis represents the culmination of complete, painstaking, and thoroughly unrewarding work-up. This diagnostic category proves that there are some cases which remain "essential," "idiopathic," "primary," "agnogenic"; in plain English, we just have no idea what caused them.

MISCELLANEOUS CATEGORIES

Having thus disposed of 76.3 per cent of our series, we dismiss another 10.8 per cent with the observation that they comprise 33 separate categories of some individually very interesting cases, but since we must draw the line somewhere, we shall make no mention of them other than listing them in table 3. Another 1.9 per cent can be disposed of by mentioning the 16 cases of "undiagnosed lesion." These patients almost to a man were disposed of by early transfer or were veterans who left against medical advice before adequate diagnostic studies were carried out. The best conclusion was that they were probably nontuberculous; thus, they have been included in this series with full realization that we could have included some tuberculosis cases.

NO PULMONARY DISEASE FOUND

We now come to the final 95 cases. They represent a very disturbing 11 per cent of our patients in whom no tuberculosis was found and who eventually were diagnosed as having no type of pulmonary disease. A few words of explanation regarding the local policy at this hospital are in order to clarify something of what at first appears to be an appallingly large group of cases.

This hospital is not only a large general hospital serving a widespread military and Air Force population and their dependents, but is also a major pulmonary disease, and especially, a major tuberculosis center. A policy has gradually been built up which is somewhat the reverse of that found in almost any other large hospital, military or civilian.

Ordinarily, cases for study and work-up without a definitive diagnosis, whether received by transfer or admitted directly from our own outpatient clinics, tend to be admitted to the tuberculosis service if by any stretch of the imagination tuberculosis seriously enters into the differential diagnosis. In most other hospitals, a great number of these patients would probably be admitted to the general medical wards and only transferred to the tuberculosis service if some positive evidence of tuberculosis was found. Thus, undoubtedly, some of the 95 patients in whom no pulmonary disease was found and, indeed, some patients from the previously discussed categories, would originally have landed on the general medical service rather than on the tuberculosis service had they been sent anywhere but to this hospital. Having thus explained away some of our "no pulmonary disease found" as a mirage, we are still left with a substantial number who were needlessly diagnosed as tuberculous and admitted to a tuberculosis hospital. Most of these cases represent avoidable errors. When we consider the severe psychic trauma to the individuals concerned, the interference with a man's career, the unnecessary family inconvenience, the large costs to the Government involved in sending a man half way around the world (in many instances with his family and his furnishings), the unnecessary time lost by a possible essential man on an essential job at an essential time, we can readily see that the error is a costly one, often with far greater implications than a simple mistake in medical judgment.

What then can be done to reduce this source of error? Most of the answers have already been indicated in earlier sections of this article. Thoughtful consideration and attention to detail should be given in all cases. A few specific points are summarized below:

Tuberculin Testing. This should be done in all suspected cases. As the percentage of tuberculin reactors in our population drops, the tuberculin test is becoming an ever-increasingly important pro-

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cedure. A negative test with freshly prepared intermediate and second strength PPD excludes tuberculosis except in overwhelming infections or early in the course of primary infections. The overwhelming infection is usually obvious even without the tuberculin. If the tuberculin test does not convert within six to eight weeks after the onset of the disease, the chances are almost 100 per cent that tuberculosis can be excluded.

The False Positive Sputum or Gastric Concentrate. Many of the patients eventually cleared as having no pulmonary disease are admitted because of a single positive laboratory report on sputum or gastric contents, with no other evidence to support a diagnosis of tuberculosis. Smears of gastric concentrate are a frequent source of error since acid-fast saprophytes, morphologically indistinguishable from *Myco. tuberculosis,* are frequently found in smears of stomach aspirates.

We believe that smears of gastric concentrates are so frequently misleading that we do not even run them or report them at this hospital. Instead, we wait for culture results which, with newer technics, can be obtained in a relatively short time.

Sputum smears are also open to errors of interpretation. A trained technician who is thoroughly familar with the morphologic characteristics of acid-fast bacilli is required to correctly interpret the sputum concentrate. At times, small scratches in the slide can pick up the acid-fast stain, or imperfect staining technics may result in what are apparently acid-fast bacilli but in reality represent foreign material. At times, though rarely, acid-fast organisms other than *Myco. tuberculosis* might be found in the sputum. A positive smear of either sputum or gastric contents, if confirmed by culture, should be suspect.

Cultures also may be misleading, because certain atypical, acid-fast organisms or nonpathogenic contaminants occasionally grow on culture media. If the culture is reported as positive in too short a time for the technic used, serious doubt should be entertained that the growth observed actually is *Myco. tuberculosis.* The possibility always exists of laboratory errors such as mislabeling of specimens, although with painstaking technics errors can be kept to a minimum. In spite of this, however, it always is possible in a very busy laboratory that a positive result might be reported when it actually represents a specimen obtained from another patient.

A single unexplained positive finding by smear, culture, or guinea pig inoculation that does not fit with the clinical situation is always open to a certain question of accuracy. If repeated examinations fail to confirm this single finding, further suspicion arises as to the validity of the single positive report. Thus, we say that good judgment must be exercised and that under certain

circumstances we are justified in eliminating a positive bacteriologic report on good clinical grounds.

Accurate Interpretation of Roentgenograms. While it is most important that we do not miss significant abnormalities, which unfortunately are too often overlooked, we must also be careful not to grossly over-read the roentgenograms. In suspicious cases, repeat roentgenograms with additional views such as apical lordotics, obliques, laterals, and tomography should be obtained to confirm or better delineate a suspected lesion.

Fluoroscopy is also very useful in localizing suspected abnormalities. A diligent search should be made in all suspicious cases for old films. In the military, at least a roentgenogram made at the time of induction usually is available. Comparison of serial films often is a vital factor in making a diagnosis.

Bronchoscopy. In many cases, bronchoscopy is important to prove or disprove endobronchial disease. This is a simple and readily available procedure which can be performed in most military hospitals. At the time of bronchoscopy, bronchial washings for tuberculosis, fungi, and tumor cells can easily be obtained.

Bronchography. This often is a very important diagnostic tool. In the past, there has been some hesitation in using this modality because Lipiodol (brand of iodized oil) shadows obscured the evolution of serial roentgenographic findings for some time. Today we have good water-soluble media which are readily eliminated and will give excellent pictures without interfering with future roentgenographic studies. In indicated cases, therefore, this procedure should be done with no hesitancy.

Diagnostic Biopsy. Diagnostic biopsy of available nodes, or diagnostic thoracotomy, is necessary at times and should be done wherever needed. If performed by a competent surgeon, the risk is small and frequently is much less than the risk of not doing the biopsy. If tuberculosis is suspected, a short period of intensive antituberculosis therapy prior to biopsy should eliminate the danger of postoperative tuberculous complications.

All the above points are helpful hints that will save unnecessary diagnosis of tuberculosis as well as help in making the correct primary diagnosis, or permit clearance if no disease is found. However, none of the above amount to anything if we forget the basic fundamentals of good clinical medicine; namely, a careful, thorough, and painstaking history and physical examination; critical evaluation of all data, both clinical and laboratory; a high index of suspicion; a searching mind, unsatisfied by a loose or incomplete explanation; good fundamental knowledge of diagnosis and differential diagnosis; and, most important of all, just plain good common sense.

SUMMARY

Out of a total of 5,324 patients admitted to the tuberculosis service of this hospital with a diagnosis of tuberculosis or possible tuberculosis, during the years 1952 through 1956, 851 (16 per cent) were found not to have significant tuberculosis. There has been a heartening decline year by year in this group, which speaks well for improved diagnostic and differential diagnostic technics in chest diseases.

Fifteen nontuberculous conditions accounted for 649 (76.3 per cent) of our cases. These 15 conditions are discussed in some detail. Final clearance with diagnosis of "no pulmonary disease found" was given in 95 (11 per cent) of our cases.

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AMERICAN COLLEGE OF SURGEONS MEETING TO BE HELD IN ATLANTIC CITY

The 43d Clinical Congress of the American College of Surgeons will be held at Convention Hall in Atlantic City, N. J., from 14 to 18 October 1957. Panel discussions will be a major feature of both the general sessions and sessions concerned with the specialties of Gynecology and Obstetrics, Neurologic Surgery, Orthopedic Surgery, Plastic Surgery, Thoracic Surgery, and Urology. Closed-circuit operative telecasts, film lectures, and medical motion pictures will be popular items, as will be the Forum on Fundamental Surgical Problems. This year, eight postgraduate courses also will be given. The detailed program may be seen in current issues of Surgery, Gynecology, and Obstetrics.

STUDY OF 507 PATIENTS DISCHARGED FROM A TUBERCULOSIS SERVICE

A Year's Experience at a Naval Hospital

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THE TUBERCULOSIS service at this hospital is maintained for the reception, diagnosis, treatment, and disposition of military patients referred because of known or suspected tuberculosis. More than 500 patients are processed annually. In the belief that they may be of interest to others, data are reported on 507 patients who were discharged between 1 October 1955 and 30 September 1956.

Of the 507 patients, 481 (94.7 per cent) were members of the U. S. Armed Forces on active duty. Twenty-six (5.3 per cent) were supernumerary patients. These included 1 member of a foreign navy; 1 civilian evacuated from overseas; 13 retired members of the U. S. Navy; and 11 dependents of military personnel, including 2 children, who were sent in from overseas or admitted in emergency circumstances.

Of the 481 military patients, 24 (4.9 per cent) were officers and 457 (95.1 per cent) were enlisted personnel; 211 (43.8 per cent) were from the U. S. Navy, 39 (8.2 per cent) from the U. S. Marine Corps, 210 (43.6 per cent) from the U. S. Air Force, and 21 (4.4 per cent) from the U. S. Army. Most of the military patients were Caucasian males in their early twenties (table 1).

DIAGNOSTIC PROCEDURES

Diagnostic procedures on admission included routine immunologic, bacteriologic, and roentgenographic examinations, conducted in an admitting unit under the supervision of a medical officer and the nursing supervisor.

Immunologic studies consisted of intradermal tests performed regularly by a single experienced hospital corpsman, using tuberculin (0.00002 or 0.0001 mg of purified protein derivative), coccidioidin (1:1,000 or 1:100), and histoplasmin (1:1,000 or

From U. S. Naval Hospital, St. Albans, N. Y.

1:100). Patients who failed to react to the smaller doses were retested with the larger. Old tuberculin (1:100) was employed in doubtful cases. The syringes used for each antigen were kept segregated.

TABLE 1. *Race, sex, and age of military patients on active duty.*

	Number	Per cent
Race		
Caucasian	409	85.1
Negro	65	13.5
Mongolian	2	0.4
Malayan	4	0.8
American Indian	1	0.2
Sex		
Male	473	98.3
Female	8	1.7
Age in years		
17-19	61	12.2
20-24	203	42.2
25-29	96	19.9
30-39	84	17.5
Over 40	37	8.2

Inasmuch as the Navy has practiced tuberculin testing of Navy and Marine Corps recruits since 1949, the tuberculin reaction of most sailors and marines at the time of their enlistment is shown on their records. This information provided an important diagnostic point of reference.

Sputum specimens, when available, were examined by smear and culture. Where sputum was not available, at least three specimens of gastric contents from the fasting patient were inoculated on culture media. Bacteriologic work was conducted by full-time personnel in a laboratory built especially for mycology and tuberculosis bacteriology, and equipped with maximum safety features to protect the workers.[1] Roentgenograms of the patients' chests were made and compared with those that usually accompanied them.

Bronchoscopy was abandoned as a routine procedure in 1954 after an analysis of 247 consecutive cases showed that routine bronchoscopy produced positive findings in only 22 (8.5 per cent) of the cases. This small harvest did not appear to justify the anesthetic risk to the patients, the direct exposure of personnel to infectious material, or the labor involved. Bronchoscopy was, of course, performed when indicated.

To reduce the length of hospital stay, loss of treatment time, and patient demoralization, every effort was made in each case to reach a diagnosis within 10 days. The patient was then brought before a treatment conference, told his diagnosis, prospective treatment, and disposition, and invited to ask questions. When it proved impossible to establish a diagnosis within 10 days, the reasons for delay were clearly explained.

All patients except eight were tested with tuberculin. Of the eight, five were transferred at once to the surgical service where the admission diagnosis was established by the pathologist; in the other three, the diagnosis of tuberculosis was already abundantly proved, so that the test was superfluous.

Some of the results of the diagnostic procedures are of particular interest. Five patients with tuberculosis were "bacteriologically positive" but "tuberculin negative." One of these was anergic because of acutely disseminated disease and one, who had primary tuberculosis, was assumed to have delayed reactivity. Technical errors probably were responsible for failure to obtain positive tuberculin reactions in the remaining three cases.

Bacteriologic proof of tuberculosis, either from records accompanying the patients or from our own studies, was obtained in 214 (72.1 per cent) of the 308 military patients with active pulmonary tuberculosis. The chief reason for this small percentage was the large number of patients who had only minimal infection that had been detected by routine roentgenography. The percentage of positive bacteriologic findings was 42.7 per cent in cases classed as "minimal," 82.1 per cent in the "moderately advanced" cases, and 92.6 per cent in the "far advanced." Against this background, it was diagnostically reassuring to find that among the 66 Navy and Marine Corps patients under the age of 25, whose reaction to tuberculin at the time of their enlistment was known, it was possible to demonstrate "Mantoux conversion" in 51 (77.1 per cent). Tuberculin negativity is so characteristic of young Americans[2] that a reaction to tuberculin is significant, and "Mantoux conversion" practically diagnostic.

Of the Navy and Marine Corps patients hospitalized with tuberculosis, 22.9 per cent had had a positive reaction to tuberculin at the time of their enlistment, whereas only 4.6 per cent of recruits in general have a positive reaction.[2] This marked difference suggests that a positive reaction to tuberculin is a liability to a young man or woman.

Among the 39 patients with tuberculous pleurisy, bacteriologic proof was obtained in only 5 (12.9 per cent). Many of these pa-

tients had been tapped and drained prior to admission here, and consequently offered no fluid for study. Seventeen of these patients were members of the Navy or Marine Corps, and 16 of the 17 were demonstrated to be recent "Mantoux converters." This is additional evidence supporting the view that a young American with an idiopathic pleural effusion who has a positive reaction to tuberculin had best be treated for tuberculosis.[3]

Testing with histoplasmin and coccidioidin resulted in other noteworthy findings. Among 468 patients tested with histoplasmin, 95 (20.3 per cent) reacted, whereas of 469 given coccidioidin only 20 (4.3 per cent) reacted. Similar percentages were reported from this hospital in the preceding two years.[4]

DIAGNOSES

The diagnostic findings, in general, did not differ greatly from those reported at Fitzsimons Army Hospital in 1953.[5] A diagnosis of tuberculosis in some form was established in 366 (76.1 per cent) of the military patients. The categories are listed in table 2.

TABLE 2. *Categories of tuberculosis in 366 of 481 military patients*

Category	Number	Per cent
Total	366	100.0
Pulmonary tuberculosis		
Arrested	4	1.1
Primary	3	0.8
Active, minimal	117	31.9
Active, moderately advanced	134	36.6
Active, far advanced	54	14.7
Tuberculous pleurisy	39	10.7
Tuberculosis extrapulmonary		
Of mediastinal lymph nodes, primary	3	0.8
Of superficial lymph nodes	2	0.6
Of kidney	1	0.3
Meningitis	1	0.3
Disseminated from lungs	4	1.1
Miliary	3	0.8
Unclassified	1	0.3

More of the cases of active pulmonary tuberculosis among personnel in the naval service were discovered by routine roentgenography (84, or 62.3 per cent) than by investigation of symptoms caused by tuberculosis (54, or 37.7 per cent). The situation was almost the reverse among a comparable number of Air Force personnel. Fifty-seven (40.1 per cent) of these were first de-

tected by roentgenography and 85 (59.9 per cent) because of symptoms. This difference probably arises from the practice in the Navy and Marine Corps of taking annual photofluorograms of personnel.

Twenty-one of the military patients were first found to have pulmonary tuberculosis while under treatment for other diseases or injuries. Even this small number emphasizes the value of tuberculosis case finding programs in general hospital populations.

Of the 39 patients with tuberculous pleurisy, 33 presented themselves because of symptoms (nearly always pleuritic pain, fever, cough, and dyspnea of abrupt onset). Three, who claimed to be asymptomatic, were detected by routine roentgenography. In 3 cases, the disease appeared while the patients were under treatment for trauma, acute diarrhea, and amebiasis, respectively.

The nontuberculous entities encountered, most of which are self-explanatory, are listed in table 3. These conditions posed the differential diagnostic problems. Percentages are not stated because the whole numbers approximate the percentages.

The most unusual differential diagnostic problem was that presented by a man with a nondescript, bilateral, pulmonary infiltration and dysphagia. Examination revealed cardiospasm with regurgitation of esophageal content into the tracheobronchial tree.

The instances of pleurisy classed as nontuberculous were those occurring in patients who failed to react to tuberculin.

The diagnosis of histoplasmosis is difficult to establish with certainty because it seldom can be proved mycologically. It usually is made either by excluding tuberculosis by means of the tuberculin test or by an evaluation of often incomplete evidence in the case of a patient who reacts to tuberculin as well as to histoplasmin. In all of our 18 cases, the possibility of tuberculosis was eliminated as certainly as possible, by bacteriologic cultures. In two cases, *Histoplasma capsulatum* was identified in "coin lesions" resected from patients, both of whom had been transferred from Panama. Thirteen of the remaining patients were "histoplasmin-positive, tuberculin negative," but the other three reacted to both antigens. One of these three, also admitted from Panama, had a pneumonitis that cleared in a few weeks. He has remained well for a year. The other two men, from Tennessee and Kentucky, respectively, displayed pulmonary calcifications only.

Activity was deemed to be present in eight cases because of exudative pulmonary lesions, histoplasmosis complement fixation titer of 1:16 or greater, or report of a granuloma in a liver biopsy, singly or in combination.

TABLE 3. *Nontuberculous diseases seen in 115 of 481 military patients*

Nontuberculous disease	Number
Total	115
Histoplasmosis	18
Medical observation	14
Infiltration, pulmonary, cause undetermined	13
Calcification, pulmonary, cause undetermined	9
Granuloma, pulmonary, cause undetermined	9
Pleurisy, chronic nontuberculous	7
Fibrosis, pulmonary, cause undetermined	7
Pleurisy, acute serous, cause undetermined	5
Pneumonia, primary atypical	4
Bronchitis, chronic	4
Sarcoidosis	3
Pneumonia, not elsewhere classified	3
Abscess of lung	3
Carcinoma of lung	2
Empyema, pleura	2
Bronchiectasis	2
Coccidioidomycosis	1
Bronchitis, acute	1
Bronchopneumonia	1
Adhesions of pleura	1
Pneumothorax, spontaneous	1
Pneumonia, interstitial, chronic	1
Atelectasis, cause undetermined	1
Peritonitis, chronic, cause undetermined	1
Achalasia	1
Physical examination	1

Treatment of active cases of histoplasmosis consisted of rest, with or without resection of lesions. All patients were ultimately returned to duty.

Throughout the year, an increasingly successful attempt was made to minimize the use of the diagnostic terms "infiltration," "calcification," and "fibrosis, pulmonary, cause undetermined." It is not uncommon for the physician to base his opinion and case-management on probabilities,[6] and careful evaluation of the evidence at hand will usually lead to more definite conclusions in cases so labeled. We retain the term "granuloma, pulmonary, cause undetermined," however, for the postsurgical case in which even the pathologist has been unable to make an etiologic diagnosis. When the ultimate in contemporary technic, namely, histologic and microbiologic examination of excised tissue, has failed, it appears logical to admit the failure and avoid stigmatizing the patient.[7]

TREATMENT

With the exception of an older, emphysematous man whose "coin lesion" was removed for suspected carcinoma, all patients having active tuberculosis were treated initially with modified bed rest and chemotherapy. Chemotherapy was prescribed for 217 patients according to the Veterans Administration—Armed Forces Protocols for the Chemotherapy of Tuberculosis.[8,9] Such therapy could not be applied to 81 cases already committed to another program prior to arrival, nor to 37 cases because of the timelag between expiration of the 1955 protocols and receipt of their 1956 successors. Protocol therapy was not used in 28 other cases for miscellaneous reasons, including manifestations of tuberculosis not covered by protocols, patient intolerance of drugs prescribed, and administrative oversight.

Three severe hypersensitivity reactions were encountered: 2 to streptomycin and 1 to para-aminosalicylic acid.

Forty-two patients received some form of surgical therapy, other than thoracentesis. There were 34 unilateral subsegmental or segmental resections, 1 bilateral segmental resection, 1 lobectomy, and 1 pneumonectomy. There also were 1 spine fusion for tuberculosis of the vertebrae, 1 decortication, and 1 plastic repair of the chest wall after incision and drainage of a cold abscess. Many of the patients who were transferred to Veterans Administration hospitals were candidates for surgical treatment at a later date.

DISPOSITION

Nontuberculous patients were either returned to duty or transferred to other departments of the hospital. The single death ascribed to tuberculosis was that of a man whose miliary-meningeal disease escaped attention for some weeks before he was admitted to the sick list. Interestingly enough, this man was

brought to medical attention by his friends because of a personality change simulating schizophrenia.

The disposition of military patients with pulmonary tuberculosis is shown in table 4. There were no irregular discharges.

TABLE 4. *Disposition of 308 military patients with pulmonary tuberculosis*

Service	Recommended for duty	Transferred to V. A. hospitals	Other disposition
Total	42 (13.6%)	259 (84.1%)	7 (2.3%)
U. S. Navy and Marine Corps	10	139	1*
U. S. Air Force	30	113	5**
U. S. Army	2	7	1**

*Discharged administratively.
**Transferred for humanitarian reasons to other military hospitals to complete treatment.

Eight of the 39 patients with tuberculous pleurisy were returned to duty after treatment, 30 were transferred to Veterans Administration hospitals, and 1 was transferred for humanitarian reasons to another military hospital to complete treatment. The disposition of patients with extrapulmonary tuberculosis was individualized.

Ten years ago a military tuberculosis service concerned itself primarily with the elimination of the unfit, and 10 years hence improved therapy may have eliminated such a service, but in the meantime it conducts a salvage operation designed to prevent unnecessary waste of restorable manpower. We have not hesitated to recommend return to duty of selected patients with pulmonary tuberculosis, prescribing such limitations as may be indicated in the individual case. The field of posttreatment restrictions in this new era of chemotherapeutically and surgically treated cases is in a state of chaos, often dominated more by opinion and dogma than by facts. In these circumstances, we base our planning on observation of former patients returned for periodic re-evaluation, on the findings of Chamberlain and associates,[10] and on five-year follow-up results of surgical treatment at this hospital, as yet unpublished.

Bearing in mind the crowded conditions of life aboard ship, we have been particularly conservative in recommending return to duty of naval and Marine Corps personnel after treatment for pulmonary tuberculosis. The 10 patients so recommended were

all stable individuals over 30 years of age who had received at least one year of effective chemotherapy. Eight of them had undergone successful resectional surgery, and all had been rehabilitated to full activity.

Of the 26 supernumerary patients, 25 proved to have tuberculosis. Treatment was either begun or continued until suitable disposition could be arranged. Three of the retired Navy men died, 2 of arteriosclerotic heart disease intercurrent in active tuberculosis and 1 of carcinoma of the lung and Friedländer bacillus empyema intercurrent in an old inactive tuberculosis.

SUMMARY

From October 1955 to September 1956, 507 patients were discharged from the tuberculosis service of this hospital.

Of the 507 patients, 481 (94.7 per cent) were members of the U. S. Armed Forces on active duty. Of these military patients, 366 (76.1 per cent), had some form of tuberculosis. The remaining 115 (25.9 per cent) had other diseases and presented problems in differential diagnosis.

Diagnostic findings, in general, did not differ greatly from those reported at Fitzsimons Army Hospital in 1953.

Active pulmonary tuberculosis was discovered by routine photofluorography in 84 (62.3 per cent) and by investigation of symptoms in 54 (37.7 per cent) of the patients from the Navy and Marine Corps. Among a comparable number of Air Force personnel, 57 (40.1 per cent) patients with active pulmonary tuberculosis were first discovered by roentgenography and 85 (59.1 per cent) by investigation of symptoms.

Twenty-one military patients were discovered to have pulmonary tuberculosis while they were undergoing treatment for other diseases or injuries. This emphasizes the value of tuberculosis case-finding programs in general hospitals.

Nontuberculous conditions that often were difficult to distinguish from tuberculosis were histoplasmosis; and pulmonary infiltration, calcification, or granuloma, of unknown, but nontuberculous cause.

Ten Navy and Marine Corps patients were recommended for duty after treatment for pulmonary tuberculosis.

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"Death is something that even doctors shy away from discussing with patients facing it. To allow and even draw them out about it is most demanding and stirs up considerable anxiety within the therapist. In fact, there is a great temptation to escape a discussion of death by diverting the patient from this topic or offering meaningless platitudes . . . . Much fear can be banished and . . . much courage and tranquility can be achieved if the doctor can be a little less afraid than the patient."

—*Psychiatric Bulletin,* p. 66,
Summer 1955 (Vol. 5, No. 3)

INCREASING DENTAL SPEEDS

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G. V. BLACK[1] once stated that, "The professional man has no right to be other than a continuous student," and rapid advances in dental operative instruments during the past few years have made this statement especially applicable to our present period. The range of speed available to the profession has increased to such an extent that we have far surpassed what Walsh and Symmons[2] advocated in 1949; however, there still is little agreement as to what is the optimum speed of rotation. The answer will have to be derived by the slow process of correlating clinical and laboratory data. We cannot make snap decisions in either laboratory or clinic, but must patiently weigh and evaluate our results, and from the mass of accumulated information evolve what is best for the profession.

Over past decades, the various specialties of dentistry advanced to a remarkable degree, but not until 1940 to 1946, in conjunction with advances being made in precision instruments, machine tool manufacture, and diamond and carbide burs, did operative dentistry begin to come into its own. Whereas in the past we all have experienced difficulty in penetrating the occlusal enamel, penetration now can be accomplished in a matter of seconds. New concepts in operative technics[3] have shortened operative time to such a marked degree that chair time may be reduced by 50 to 60 per cent, depending on the type of restoration.[4,5]

METHODS OF INCREASING SPEEDS

The types of power being used or investigated at present are: (1) air, (2) water, and (3) motor. Although none of these are new in concept, the various applications are interesting and time alone will tell their relative value.

Air-Turbine Handpiece. Air has been studied as a possible power source by several investigators in various parts of the world. Tanner and Mitchell[6] reported that speeds of 55,000 r. p. m. and higher were attained with an instrument running free. A small

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turbine is located in the head of the handpiece, resulting in a compact, balanced instrument.

Stephens[7] described two experimental models with speeds in the 25,000 to 35,000 r. p. m. range. Large turbines are located on the spindle end of these instruments, and rotor speed of 50,000 to 70,000 r. p. m. were obtained. When used with the Imperator handpiece, speeds were about 35,000 r. p. m. Acrylic was used in the housing and rotor in an effort to study the functioning of these experimental models.

The air-driven handpiece described by Peyton[8] has a speed of about 75,000 r. p. m. when cutting, and higher speeds when running free. The turbine is located on the spindle end of this handpiece.

At the present time there is an indication that several handpieces utilizing the air-turbine principle will soon be available commercially and will attain speeds in the 200,000 to 300,000 r. p. m. range.

Water-Turbine Handpiece. There are several experimental models of water-turbine handpieces, and one type is now commercially available. A water-turbine (hydraulic) handpiece developed at the University of Michigan operates at about 60,000 r. p. m.[8] The rotor or drive turbine of this instrument is located on the spindle end.

The hydraulic handpiece developed by Nelsen, Pelander, and Kumpula[9] is in the 61,000 r. p. m. range. It has a small drive turbine in the head of the contra-angle.

Both air-turbine and water-turbine instruments are free of the usual engine-arm and belt sources of vibration. Because of a minimum number of moving parts, they also are relatively free of heating. These instruments have low torque values and can be stopped readily by heavy loads or pressures applied to the cutting tool, so that stones, large-sized diamonds, and disks are relatively ineffective. The air-turbine handpiece offers slightly higher torque values, making it effective with burs. This may be due to the slightly greater mass of its impeller or turbine. The low torque relation of many of these new instruments actually is of value for those who have a tendency to bear down or use too much pressure in cutting procedures.

A hard-water source may create a slight problem with the water-turbine instrument. A major problem with the air-turbine handpiece in the past has been the high noise level created by the escaping air, but newer models have insulation in and around the turbine head to eliminate some of the noise.

Motor-Driven Handpiece. A dental handpiece with a small electric motor attached to the spindle end of the instrument was developed at the University of Michigan for the United States Army.[8] The latest model was built by the Hanau Engineering Company, Inc. This instrument operates from a 12-volt-battery source and develops 15,000 r. p. m. with a straight handpiece and 9,500 r. p. m. with contra-angle. The contra-angle attaches to the straight handpiece by a sleeve union. It would be interesting to see what the increase in r. p. m. would be with one of the newer contra-angles that increase the r. p. m. 2½ times in the contra-angle head. The average handpiece weighs 5½ to 6 ounces. This instrument weighs 6½ ounces and is well balanced. The stalling torque is 2.8 ounces.

This instrument offers many possible uses in the sick room, hospital, remote areas, et cetera. The Army Research and Development Division is now field-testing it for military applications. Indications are that a handpiece of this type will be made available commercially in the near future. It will contain a belt ratio drive from the motor to the contra-angle head and will develop speeds well into the 100,000 + r. p. m. range.

Motor of Unit. In a survey of 50 units being used by practitioners, Kilpatrick[10] found a maximum range of 6,000 r. p. m., with an average of about 3,500 r. p. m. Most manufacturers now provide a multiple speed unit with a more powerful engine and a selection of speed ranges. In the old type unit having normal speeds of 4,000 to 6,000 r. p. m., opening the shunt resistance of the motor circuit will produce approximately the following speeds for units of the makes indicated: (1) S. S. White Dental Manufacturing Co., 8,500 to 9,000 r. p. m.; (2) Ritter Co., 10,000 to 13,000 r. p. m.; (3) Weber Dental Manufacturing Co., 16,000 r. p. m.

According to the manufacturers, motors will tolerate the increased speeds without excessive wear, provided they have plastic insulation between the poles of the commutator instead of the old type mica insulation. The resistors are porcelain tubes about 4 inches long, light green or white in color, lying in a horizontal or vertical position within the dental unit. A toggle switch placed in the wiring circuit will give increased speeds when the resistors are cut out. This change does not affect the automatic breaking of the series-wound motor.

Engine Pulley. An increase in the diameter of the engine pulley by a ratio of 2:1 over the diameter of the handpiece pulley will increase the operating speed by about the same amount.[7] The average present-day engine pulley is 1 to 1½ inches in diameter. By increasing the size of the pulley to 2½ or 3½ inches, speeds up to 20,000 r. p. m. can be attained.

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Belts and Belt Tension. Belt tension plays an important part in increased speeds. With proper slack, which also adds a safety factor, speeds can be increased as much as 2,000 r. p. m. By listening to the pitch of the rotating handpiece, proper adjustment of the belt tension can be made. Kilpatrick[11] suggested the use of fiddlers rosin on the belt to lessen slippage tendencies.

Various fibers are being investigated and tested in an attempt to prolong belt life. The life of most belts may be lengthened by washing with a detergent once or twice a month and allowing the belt to dry overnight before using.

Friction. Friction is the main foe to increasing handpiece speeds. By removing the idler pulleys on the belt armature and replacing them with ball bearing idler pulleys, friction will be reduced and an increase of 6,000 to 10,000 r. p. m. can be obtained. This also helps to eliminate some of the drag on the dental engine.

Handpiece Improvements for Higher Speeds. Manufacturers have approached the problem of improving handpieces for use with higher speeds in different ways. Some of their improvements are: modified sleeve bearing; metal bearing surfaces that are self-aligning on the shaft; use of ball and socket principle; stainless steel ball bearings; improved chucks; improved bur insert and latch (made of hardened steel or carbide); closer tolerances; longer sheaths; phosphobronze, sapphire, needle, or glass bearings; ratio belt drive (no gears); automatic oil mist (no oiling); self-contained water spray; and self-contained air cooling.

This is not a complete list, but it indicates the types of improvements that have been made in handpieces to go with higher speeds.

VIBRATION STUDIES

Vibration is a nuisance factor that causes tension and apprehension in the patient. In 1948 and 1949, Walsh and Symmons[12, 13] published their far-reaching reports on vibration perception. Their basic work was a milestone for the dental profession. All their tests were performed with an oscillometer on the upper central incisors of patients. They found that the upper threshold of sensation was from 500 to 600 cycles per second (c. p. s.), with a mean of 560 c. p. s. Maximum unpleasantness occurred from 100 to 200 c. p. s., with a mean of 178.2 c. p. s. The range of vibration caused by the dental handpiece was found to be from 95 to 115 c. p. s., with a mean of 111 c. p. s., which falls within the maximum unpleasantness range. As a result of their studies, Walsh and Symmons also concluded that the harder the material being cut the higher the harmonics.

Henry and Peyton,[14] in their vibration studies of rotating dental instruments, came to the conclusion that when operating with light pressures there is a tendency for the amplitude of vibration to decrease as the speed is increased, with the larger burs showing a greater vibration characteristic.

Sources of possible unpleasant vibrations include poor adjustment (contra-angle and handpiece); worn clutch, latch, bur seat (lateral play), or bearings; frayed belt; belt vibration; and eccentric bur vibration. In short, any movable part of the system can contribute to vibration. To overcome some of the handpiece vibration, several manufacturers have changed to longer sheaths, and instead of gear drive have used a belt drive or the turbine principle.

Hudson and associates[15] showed by high-speed photography that an eccentric-rotating dental instrument in an increased speed range of 6,000 to 10,000 r. p. m. can cause vibration of 100 to 200 c. p. s., which is in the unpleasant range for the patient, and that true-running burs produce vibrations well above 600 c. p. s. when rotated at the same speeds.

TEMPERATURE STUDIES

Hensel and Mann[16] showed that a variance of 10°C from the normal body temperature caused pain at the dentoenamel junction of patients. This seems to agree with Henschel's studies,[17] in which he showed the pain tolerance zone of patients to be from 85° to 130°F.

Bur Temperature. In studies of temperatures developed in rotating dental cutting instruments, Hudson and Sweeney[18] measured the temperature of the head of the bur during cutting. A constantan thermocouple wire was soldered between two blades of a test bur and connected to a Brown instrument-recording potentiometer, which recorded the temperature developed in the bur. In cutting dentin with the tooth held in the hand and using pressure as in normal cavity preparation, temperatures were recorded of 150°F at 2,000 r. p. m. and of 275°F at 7,500 r. p. m. In some cases, temperatures as high as 350°F were observed. In attempting to penetrate the occlusal enamel of a molar tooth at 7,500 r. p. m. with a No. 8 round bur engaged in a noncarious occlusal pit, a temperature of over 600°F was recorded.

In changing to a bakelite resin substitute, similar in physical properties to dentin, the following results were obtained: (1) The temperature developed in the groove between the bur blades with a force of 200 grams (about ½ lb), using a No. 8 steel round bur, was approximately 180°F. (2) The temperature developed on the slope of the bur blade under the same conditions was about 250°F.

(3) The temperature was found to be highest for the slope of the bur blade, and between 12,000 to 24,000 r. p. m. the curve tends to be constant.

Tooth Temperature. From 1951 to 1955, Peyton and Vaughn[19-21] used speeds of 11,000 to 16,000 r. p. m. and in 1955, speeds up to 30,000 r. p. m. In 1951 Vaughn and Peyton[19] used fissure burs with ½ to 2 lb of pressure and speeds up to 11,000 r. p. m. The maximum temperature noted was 160°F at 2 lb pressure. Their conclusions were that: (1) Maximum temperature is reached in 10 seconds after start; (2) smaller size burs produced a lower temperature rise; (3) spiral fluted burs produced more temperature rise than straight fluted; and (4) carbide burs produced less rise in temperature. This latter agrees with the findings of Lammie[22] that tungsten-carbide burs cut faster, lasted longer, and produced less heat per unit mass of enamel cut than steel burs.

In 1955 Peyton[21] worked with speeds up to 30,000 r. p. m. and tested the No. 37 inverted cone type bur. The diamond point he used was the No. 39 inverted cone point. Using No. 37 burs with ½ and 1 lb pressure and with no coolant, the steel bur produced a temperature of 70°F at ½ lb pressure and 10,000 r. p. m., which rose to 220°F at 1 lb pressure and 25,000 r. p. m.; the carbide bur, 50°F at ½ lb pressure and 10,000 r. p. m., and 170°F at 1 lb pressure and 25,000 r. p. m.; and the diamond point, 40°F at ½ lb pressure and 10,000 r. p. m. and 150°F at 1 lb pressure and 25,000 r. p. m.

A temperature rise of about 15°F was noted with the water spray coolant. When 1 lb pressure was used the water was effective in keeping the temperature rise in the tooth to less than 20°F. With no coolant, the No. 37 carbide bur showed a temperature rise of slightly less than the steel bur and the rise was almost the same for carbide as for steel burs when using coolants. The diamond instruments showed less temperature rise than was shown by the burs under all comparable conditions of study. The carbide bur generally caused a little less temperature rise in the tooth than the steel bur. It is interesting to note that these studies measured temperatures generated in the tooth structure and not in the cutting instrument as in Hudson's studies.

To measure the temperature of the structure being cut, Vaughn and Peyton[19] inserted a small thermocouple into the tooth at the dentoenamel junction, then cut away the tooth tissue until the thermocouple was exposed.

Lisanti and Zander[23] stated that the tooth is capable of dissipating heat rather efficiently, less elevation being noted in

the thicker layers of dentin, but concluded that physiologic changes occur in the dental pulp at temperatures above 130°F.

Coolants. A coolant is needed for any increase in handpiece speeds, and water spray is the most effective under practical conditions, with only a 15°F rise in temperature noted at 30,000 r. p. m. A water stream could keep this temperature rise to 1° to 2°F, but this would require 50 ml/min. The saliva ejector is not adequate for handling this amount of liquid and thus additional equipment would be required. At a flow of 18 ml/min, there is a 40°F rise of temperature. Air is not as effective, especially on diamonds, and the temperature rapidly rises with increasing r. p. m. Disks in general are not as easily cooled as burs, but perforated disks are more easily cooled than solid ones.

According to Doerr,[24] the advantages of using a coolant are that it eliminates heat and protects the pulp, tends to keep the cavity clean, prevents clogging of instruments, acts as a lubricant, cushions vibration to a certain extent, increases life of burs and diamonds, and makes it easy to remove old restorations. He lists as disadvantages the need for hose attachments, interference with vision, and splattering of mirror (a detergent used on the mirror will help to lessen this effect).

EFFICIENCY OF CUTTING INSTRUMENTS

From the tests conducted on the efficiency of cutting instruments, Hudson and associates[15] concluded that when cutting dentin, steel and carbide burs have equal cutting rates at either 5,000 or 10,000 r. p. m. When cutting enamel at 5,000 r. p. m., steel and carbide bur cutting rates are substantially the same (the life of the steel bur is much shorter), but at 10,000 r. p. m. carbides cut twice as fast as steel. At either 5,000 or 10,000 r. p. m., diamonds are more effective than either type bur.

Peyton[20] conducted tests with speeds up to 18,000 r. p. m. on Ivorine and concluded that (1) the rate of increase in efficiency is maintained rather consistently for the higher operating speeds; (2) it is not to be expected that all burs will show an equally effective increase in efficiency with an increase in operating speed; (3) the spiral type bur is more effective than the straight fissure bur at all operating speeds up to 18,000 r. p. m., because the straight fissure bur had more of a tendency to become clogged; (4) the amount of material removed is dependent upon the pressure applied; and (5) the No. 37 inverted cone bur showed one third as much active area as the No. 557 straight groove fissure bur, but will remove five times the amount of material per unit time as the fissure bur. On the basis of unit active area, a ratio of approximately 15:1 exists in favor of the inverted cone.

Higher Speeds of Rotation. Ingraham and Adelson,[25] using ivory in their studies of cutting efficiency of the No. 558 carbide bur and speeds up to 40,000 r. p. m., concluded that cutting efficiency increased with increase in speed and that doubling the pressure applied approximately doubled the rate of removal. More laboratory studies are needed at the higher speeds of rotation up to and including the 200,000 r. p. m. range, but indications are that steel burs are ineffective, carbide burs maintain their efficiency at the higher ranges of speed, carborundum stones increase in efficiency at the higher ranges, and diamond instruments maintain their efficiency, although this seems to be dependent upon peripheral speed.

The term r. p. m. means little at present and the more important consideration is the rim (peripheral) speed of the instruments. According to engineering and machine principles, diamonds are supposed to be more or most effective in the 5,000 to 9,000 feet per minute range.[26] The 1/8-inch-diameter diamond instrument at 30,000 r. p. m. has an approximate rim speed of 1,000 feet per minute. To achieve a rim speed of 5,000 feet per minute, the r. p. m. would have to be about 150,000. The 1-inch-diameter diamond instrument rotating at 20,000 r. p. m. will achieve peripherally some 5,000 feet per minute.

Design and Shape of Burs and Diamond Instruments. The best shape for cutting burs is not definitely known, and many different investigators, as well as the manufacturers, have been working on this problem for a long time.

Manufacture of steel burs. The bur itself is dependent upon the steel used.[27] Automatic screw machines are used for blanking, then burs are milled or head cut to produce the flutes or teeth. Some machines cut the side and end flutes in one continuous operation, while other machines only perform one operation, thereby necessitating a second cutting step. After processing, the burs are hardened by a salt bath and polished.

Carbide burs. Tungsten carbide burs are manufactured[28] by first making the steel shaft and brazing, soldering, or welding the tungsten carbide to this shaft. The bur head or flutes are cut with diamond instruments. A sintered-head carbide bur is available, in which the tungsten is held together by almost pure cobalt. These burs can withstand temperatures up to 800°F. The steel shafts are prone to rust if left in a strong oxidizing agent or in various types of chemical sterilizing agents. Carbides are more efficient at high speeds.[29] Reversing direction or side pressure may fracture blades. The bur should be rotating before being brought into contact with surface being cut, and better

control is assured by moving the bur in a clockwise direction around the cavity walls.

Henry[30] has reported on the problem of bur design in relation to true cutting and to clogging tendencies as affected by end flutes and changes in bur diameter, cutting length, and number of flutes. As the number of blades is decreased, the magnitude of forces at each blade increases and the thickness of chip removed by each flute should increase correspondingly. A smaller number of flutes increases the space between flutes and decreases the clogging tendency. In removing more material, each flute shows more tendency for flute wear and cutting life is decreased. Smaller number of flute are more vibratory. Henry concluded that (1) only the last one-thousandth of an inch of flute edge is effective for cutting soft material, and this distance decreases as the hardness of the material increases until in some cases only a few micro-inches of blade edge are effective; (2) the finish does not have much effect; and (3) heat treatment has a slight effect but burs without it cut equally well.

In a previous study of changes in the rake angle, Henry and Peyton[31] concluded that (1) a more negative rake angle cuts less but resists dulling more, and (2) the cutting efficiency of the bur is correlated with the angle and the percentage clearance space (at speeds up to 12,000 r. p. m. using Ivorine).

The bur manufacturers have production and labor costs to contend with in trying to produce a relatively inexpensive bur, and the small increase in efficiency does not necessarily warrant the added cost. Undoubtedly with the increase of speeds of rotation, design and efficiency experimentation might result in closer tolerances and standardization of the dental bur in the future.

Diamond instruments. The small diamonds are retained on the base by electroplating them into the metal matrix (electrolytic amalgamation). The diamond is held in place by mechanical retention. Peripheral speeds from 5,000 to 9,000 feet per minute are required for efficient operation.[29] Using the largest wheel possible to perform the cut will extend the life of the instrument. Diamond functions best on hard structures. Light pressures should be used. Better control of the instrument is had by using a dragging motion and not attempting to push it into the structure being cut. Coolant water spray helps minimize clogging and heat production. A clogged diamond is an inefficient and ineffective cutting instrument.

To clean diamond instruments, several methods may be used. Liquid and cream type cleaners containing oxygenating chemicals should be used with a stiff brush. Rubber abrasive, or ink eraser

should be used at high speed and light pressure. Hard stick abrasives resemble light baked ceramic and should be soaked in water or run under water when being used. To remove amalgam, heat the instrument lightly over a gas flame or soak in mercury overnight.

CONCLUSIONS

The use of increased dental speed has both advantages and disadvantages. Some of the advantages are that less pressure is required and less fatigue is produced, the operator has more control, the patient feels less vibration, the efficiency of burs and diamonds is increased, and chair time is decreased.

Disadvantages consist of the special practice and trained tactile sense required at high speed; the necessity of using coolants, which tend to obscure the field of operation; the need for more exacting care and maintenance of equipment, or for purchasing new and expensive equipment; the unpleasant noise level; the greater wear on ball bearings, clutch, and bur seat; the greater possibility of pulp damage; and the necessity for efficient aspiration.

SUMMARY

Dental handpiece speeds have increased rapidly in the past 10 years, and speeds in the 200,000 to 300,000 r. p. m. range are not uncommon. Innovations introduced to produce high speeds include the water turbine, the air turbine, and increased ratios of gears, belts, and pulleys. Friction is the main obstacle, and various manufacturers have introduced improvements in handpieces to overcome it.

The vibration produced by rotating dental instruments has long been annoying and distressing to the patient. The frequency of vibration produced at low speeds is in the most unpleasant range, while true-running burs and diamonds operated at high speeds produce vibration well above the unpleasant frequency range. Many factors play a part in producing unpleasant vibration, and manufacturers of dental instruments and handpieces have used various approaches to meet this problem.

Increased temperatures are produced by increase in either handpiece pressure or rotational speed. To dissipate the heat produced by increased speed, a coolant must be employed, water spray being the most effective.

The efficiency of carbide burs and diamond instruments increases with increase in speed; specifically, rim (peripheral) speed.

Increased speed offers certain advantages, but involves some disadvantages. Extensive laboratory and clinical studies will be required to determine optimum speeds of rotation, effective efficiency ranges of carbide burs and diamond instruments, and many other problems associated with high speeds.

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C-REACTIVE PROTEIN TEST IN MYOCARDIAL INFARCTION

"1. It is not a specific test for myocardial infarction; however, it seems to be an excellent adjunct in both the diagnosis and the prognosis of myocardial infarction.

"2. It is more reliable than the sedimentation rate in following the natural evolution of myocardial infarction.

"3. It is highly positive in patients with acute myocardial infarction, and qualitative changes in C-reactive protein follow clinical and electrocardiographic improvement.

"4. It is negative in healed infarctions, coronary insufficiency and 'coronary failure' syndrome.

"5. It is negative in the premonitory phase of myocardial infarction.

"6. The persistence of a positive C-reactive protein test is usually indicative of progressive infarction, phlebothrombosis or some other embolic phenomenon."

—ERNEST L. LEVINGER, M. D.
in *Annals of Internal Medicine*
p. 84, Jan. 1957

REDUNDANCY OF THE SIGMOID COLON

PETER ZANCA, *Colonel, MC, USA*

BORDERLINE anatomic variations and anomalies of the esophagus and gastrointestinal tract that cause few symptoms attract little attention and seldom are the subject of an interesting scientific report. Redundancy of the colon is one of these borderline conditions which is only casually mentioned and usually is not given serious consideration either in differential diagnosis or for the symptoms it produces. The tendency to disregard this anatomic variant is common. Actually, redundancy of the colon occurs in from 15 to 25 per cent of the general population and in about 60 per cent of all patients who suffer with chronic constipation. It should be strongly considered and differentiated from aganglionic congenital megacolon.

The purpose of this article is to emphasize the high rate of occurrence of redundancy of the colon in infants and children, and especially of the sigmoid flexure of the colon, and to reemphasize the point that this condition should be seriously entertained and ruled out before a working diagnosis of congenital aganglionic megacolon is made. Definite diagnosis of Hirschsprung's disease is made only after surgery and on histologic study of the bowel specimen.

Since Swenson, Neuhauser, and Pickett[1] brought our attention to the anatomic abnormality responsible for congenital megacolon, we have become aware of all of the signs and symptoms that lead to this diagnosis. The emphasis on this condition is so great that both pediatricians and radiologists sometimes are inclined to establish the diagnosis of Hirschsprung's disease on minimal or doubtful radiological findings. The difficulty mainly involves proper interpretation of the rectosigmoid area and areas of dilatation of the colon.

Roentgenographically, the diagnosis of Hirschsprung's disease is made when there is a constant narrowing of the rectosigmoid area for a variable distance, with dilatation of the colon proximal to the constricted area. In most cases, there is some loss in the haustral markings of the colon and some decrease in the peristaltic activity of the dilated portion of the large bowel. There also

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is a loss in the normal peristaltic activity of the narrowed segment of the colon in the rectosigmoid area, and the rectum itself appears normal in caliber and in function. The roentgen manifestations of Hirschsprung's disease have been well demonstrated in the literature. I should like only to re-emphasize the need for oblique and lateral views of the rectosigmoid area, because the narrowed segment of the colon is best seen in this way.

With a patient having a history of chronic constipation, abdominal distention, difficulty in defecation, and passage of small hard stools, the physician will order a barium enema examination with the aim of establishing or ruling out intrinsic organic disease or functional disease of the large bowel. When these symptoms are present in children and in infants, the possibility of congenital megacolon is immediately entertained. Under such circumstances, the barium enema examination is done and the roentgenographic findings frequently are equivocal.

Redundancy of the colon is a condition in which the colon is unduly long or dilated. It may form extra bowel loops and may lie in various positions within the abdominal cavity. Kantor[1] described three common varieties of redundant colon: (1) the centrally placed sigmoidal loop that rises out of the pelvis, (2) "double splenic flexure with straight efferent loop," and (3) "pelvic loop to the right." Redundancy of the sigmoid colon, as used in this article, refers to the long intrapelvic portion of the large intestine which rises high above the pelvic brim, in the abdomen, to a level above the intercristal line of the bony pelvis. This segment of the colon may lie in the midline or extend to the right or left abdominal regions.

The diagnosis of redundancy of the colon is easily made when a large part of the colon is involved; however, the problem of diagnosis remains when we are dealing only with redundancy of the sigmoid colon. Accurate diagnosis of this condition in children is especially important when the possibility of congenital aganglionic megacolon is considered.

In the usual normal colon, the sigmoid flexure of the large bowel lies well within the pelvis on the roentgenogram of the barium-filled colon (fig. 1). The diagnosis of redundancy of the sigmoid colon can be made from the roentgenogram when the superior margin of the sigmoidal loop extends well above the intercristal line of the bony pelvis after the colon is distended by either air or fluid (barium), as shown in figure 2. In this type of colon, the rectosigmoid area appears normal and there is normal peristalsis throughout the large bowel. With the large bowel emptied, the sigmoid flexure of the colon is seen to descend into the pelvis (fig. 3).

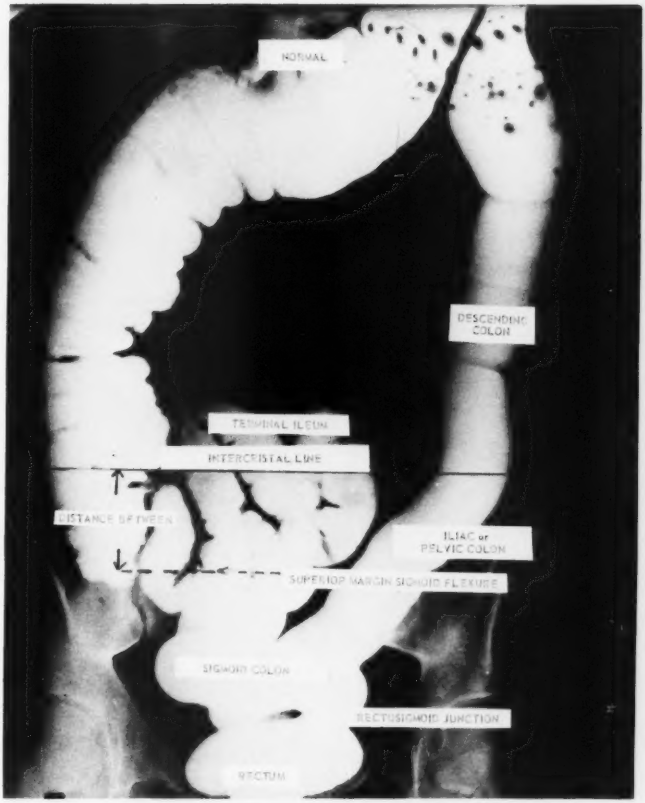

Figure 1. Normal colon distended with barium. Note position of various segments of the large bowel in relation to the bony pelvis.

The roentgenographic finding of the sigmoidal loop above the level of the pelvic inlet, with absence of a narrowed segment of the colon and with normal peristaltic function, is sufficient to differentiate this condition from congenital megacolon. The final diagnosis of redundancy of the sigmoid colon is made, however, after the following conditions are ruled out: (1) organic disease distal to rectosigmoid area, (2) functional disease distal to the rectosigmoid junction, (3) intrapelvic pathology, (4) mechanical disorders that are the result of some previous surgical procedure, (5) excessive weight loss, and (6) atonic colon following administration of drugs.

There are numerous variations of the colon which are found in individuals of different habitus. These may be due to con-

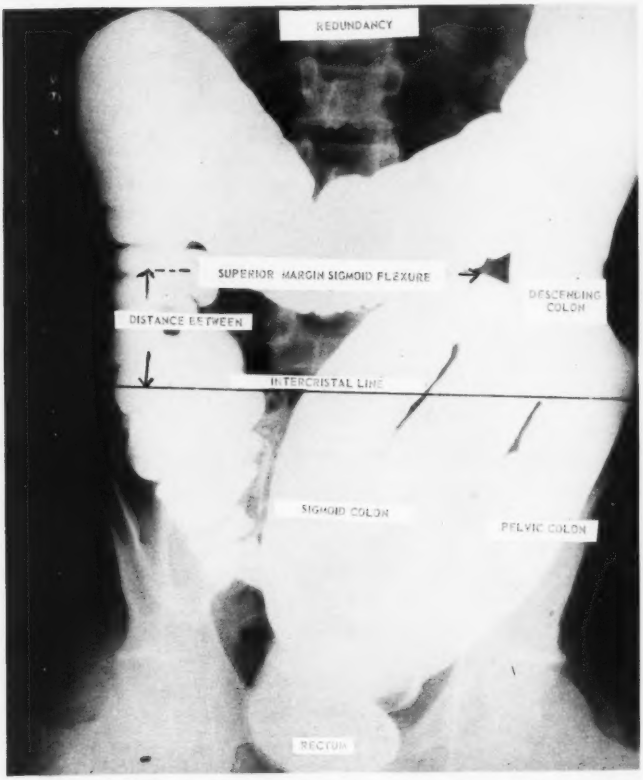

Figure 2. Redundancy of the sigmoid colon. Note high position of sigmoid flexure above intercristal line of pelvis.

genital malformation of the bowel, or secondary to malformation of adjacent tissues. In the colon, anomalies in length, malrotation or incomplete rotation of the gut, and anomalies of fixation of the bowel account for most of the variations. The sigmoidal redundancy may result from a congenitally malformed, long or large segment of the bowel, functionally disturbed segments, or hypermobility of the sigmoidal loop because of a large mesentery. Normally, the sigmoid colon is held in place by the pelvic mesocolon. This mesentery may be large or redundant and so allow for mobility of the sigmoidal loop of the colon. In the average-sized individual, the sigmoid flexure of the bowel will move only a limited distance when filled with fluid or gas. Usually it will not extend above the intercristal line of the bony pelvis. Fixation of this segment of the bowel should arouse suspicion of intra-abdominal or intrapelvic disease.

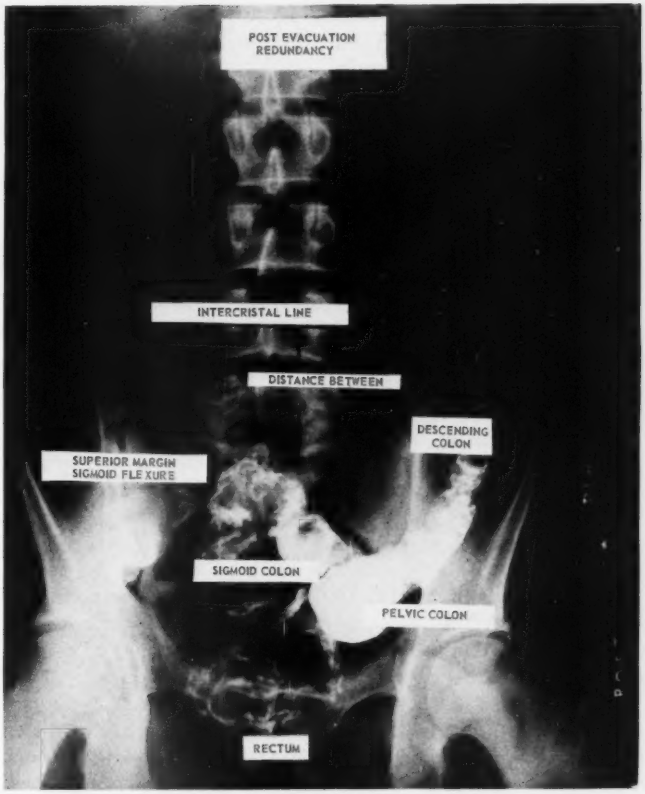

Figure 3. Postevacuation roentgenogram demonstrating empty colon with descent of sigmoid colon into its normal intrapelvic position.

Redundancy of the colon is a frequent cause of chronic constipation and should be ruled out in all patients having this symptom. Many textbooks mention that colonic redundancies constitute variations of normal and that they usually are of no pathologic significance. In some books, emphasis is made of the possible occurrence of fecal stasis in redundant segments of the large bowel; others emphasize the frequency of occurrence of volvulus and obstruction as a result of redundancy.

In 1934, Kantor[3] recorded an 18.5 per cent incidence of dolichocolon in 1,850 patients. In his series of patients, 66 per cent had had constipation from birth, 21 per cent complained of abdominal distention, and 55 per cent had abdominal pain. In reviewing 100 consecutive office case records of patients with some type of colonic dysfunction, Bockus and Willard[4] found

redundancy of the colon in 29 per cent. In 1949, Zeisel[5] reported four infants and children with chronic constipation and with redundancy of the sigmoid colon. Feldman[6] reported that the sigmoid colon is involved in over 50 per cent of all of the cases of dolichocolon. Portis[7] stated that the sigmoid colon lies in the pelvis in 90 per cent of adults; in 10 per cent it rises upward toward the umbilicus, a position usual in infants. This information was obtained from studies on cadavers. In roentgenographic studies of the living adult colon, Portis found the sigmoid colon above the pelvic brim in more than 10 per cent of the cases.

In 1956 we performed 200 barium enema examinations, many to rule out organic disease. Our patients included 14 infants and children and 186 adults, with an age range of from 3 weeks to 72 years. Some patients gave a history of chronic constipation, abdominal pain, and gaseous distention. Most of our patients had a variety of symptoms that included diarrhea, rectal bleeding, intestinal obstruction, ulcer, hemorrhoids, and possible intra-abdominal masses. Only 18 (9 per cent) of the entire group gave a history of chronic constipation; 182 (91 per cent) had other abdominal complaints and symptoms. Of the 18 patients with chronic constipation, there were 12 (66.6 per cent) who had a redundancy of the sigmoid colon; in the other 6 the sigmoid colon was within normal limits. Of 182 patients having symptoms other than chronic constipation, there were 19 (10.4 per cent) with sigmoid redundancy. The over-all rate of occurrence of redundancy of the sigmoid flexure of the colon was 15.5 per cent (31 cases). Of special interest was the finding that 14 of the 31 cases (45.1 per cent) were infants or children. All of the infants and children in this random sample had redundancy of the sigmoidal flexure of the colon; of this group, 7 (50 per cent) had been studied mainly because of chronic constipation. Of the 186 adults, 17 (9.1 per cent) had redundancy. We had 1 surgically and histologically proven case of aganglionic megacolon.

Kantor[3] emphasized the possible clinical syndrome of constipation, gaseous distention, and abdominal pain in patients with dolichocolon. We believe that more emphasis should be placed on this entity and that an attempt should be made to separate these cases from the true aganglionic megacolon, which is amenable to surgery. Faced with an infant or child with a history of chronic constipation, a barium enema examination should be performed and the following causes of constipation should be considered: (1) organic lesions of the bowel or adjacent tissues that cause mechanical obstruction; (2) functional conditions (those caused by improper diet, drugs, psychogenic disorders, poor bowel habits and sedentary life, and hypotonic or hypertonic intestinal tract); (3) diseases of peripheral nervous system; (4)

allergies; (5) trauma; (6) infection; (7) endocrinologic disorders; and (8) redundancy of the colon.

The diagnosis of redundancy of the sigmoid colon can be made in the adult after study and evaluation of the history, physical findings, and roentgenographic picture. In the infant and child, diagnosis of this condition is sometimes difficult because the colon has not assumed its full-grown, final, and fixed anatomic position in the abdomen.

In infants, multiple variations in position and caliber of the colon are common, as part of normal development and growth. The reader is referred to the excellent tracings in Caffey's[4] *Pediatric X-Ray Diagnosis* that demonstrate variations of the position of the colon in infants. These variations of development should be considered when studying the colon of infants and children, and in the absence of positive symptoms or history they should be considered as normal variants. With symptoms of chronic constipation, obstruction, distention, and pain, and in the presence of normally formed bulky stools, the possible diagnosis of redundancy of the colon should be entertained.

Management of the redundant colon is directed toward establishing good health habits with proper diet, avoiding drastic laxatives and enemas, and establishing regular time schedules for eating and defecation. Recently, beneficial effects and good results have been obtained by treatment with senna (*Cassia acutifolia*). Some cases of redundancy of the sigmoid colon have been successfully treated by segmental resection.

CONCLUSIONS AND SUMMARY

Redundancy of the colon is an anatomic, physiologic variant that is found in the newborn infant but persists into adult life in only a small per cent of individuals. Redundancy of the sigmoid flexure is the most common form, and is sometimes mistaken for aganglionic congenital megacolon.

From a study of 200 barium enema roentgenograms chosen at random, it may be concluded that the over-all rate of occurrence of redundancy of the sigmoid colon is about 15 per cent. It is frequently found in children and infants, and is present in about 1 out of 10 adults. The incidence in adults who give a history of chronic constipation or have some other abdominal complaint is relatively low (9.1 per cent, or 17 of 186 cases in this series). The incidence of redundancy in infants and children who give a history of chronic constipation or of some other abdominal complaint is high (100 per cent, or 14 of 14 patients in our series).

The low rate of redundancy in the adult and the very high rate of redundancy of the sigmoidal flexure in children and infants

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suggests that the redundant infantile colon might, in some cases, revert to the normal anatomic and physiologic colon of the adult.

Patients with redundancy of the colon are inclined to develop constipation, and chronic constipation frequently is accompanied by or causes sigmoidal redundancy (in 12 of 18 cases, 66.6 per cent, in this series).

Accuracy of diagnosis of redundancy of the colon is essential in symptomatic patients, for proper medical management.

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THE SIGMOID SEGMENT AS A BLADDER SUBSTITUTE

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WARNER F. BOWERS, *Colonel, MC, USA*
CLAUDE C. DODSON, *Colonel, MC, USA*

EVISCERATION of the pelvic organs, whether it be for tumors of the internal genitalia, bladder, or colon, may require excision of the bladder, making it necessary to provide some method of dealing with urinary drainage. Essentially, there are three possibilities: (1) cutaneous ureterostomy, (2) wet colostomy, or (3) bowel segment substitute.[1] In each method there are definite hazards and complications, as well as favorable points for consideration. Probably there is a place for each of these procedures.

CUTANEOUS URETEROSTOMY

Formerly, when more definitive procedures carried a prohibitively high mortality rate, bilateral cutaneous ureterostomy was an acceptable procedure. Now, however, it rarely is necessary to resort to this less satisfactory operation. Two urinary cutaneous fistulas plus a colostomy seem to be more than the patient should be asked to bear. Furthermore, the stomata are difficult to keep dry and repeated catheterization usually leads to infection. Cutaneous ureterostomy is indicated in severely ill patients who will not tolerate more extensive surgery, in cases where there is marked hydronephrosis and hydro-ureter from tumor compression, and where there is marked reduction in kidney function either from pressure of obstruction or from urinary tract infection. In these instances cutaneous ureterostomy may be lifesaving, and a more acceptable procedure may be substituted later if the tumor is controlled and if kidney function improves sufficiently.

WET COLOSTOMY

If kidney function is good and hydro-ureter and infection are not prominent, implantation of the ureters into the intestinal tract is advisable. The simplest of these procedures is uretero-

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sigmoid implantation, forming a wet colostomy. Cited as a disadvantage is the psychic trauma from absence of micturition, but surely this is not serious. The serious complications are: (1) ascending infection, which often is fatal; (2) ureteral obstruction at the site of anastomosis; (3) decreased kidney function incident to one of the preceding; (4) fistula formation; and (5) a large surface for reabsorption of urine. Inasmuch as it is relatively simple to form a separate loop into which the ureters can be implanted, obviating most of the difficulties enumerated above, there seems little excuse for continuing to use the wet colostomy by choice.

BOWEL SEGMENT SUBSTITUTE

Electrolyte Imbalance. Much has been said regarding the development of electrolyte imbalance and various abnormal chemical changes due to the reabsorption of urine following uretero-intestinal anastomosis. Both large-bowel and small-bowel segments have had their respective proponents. It might be supposed theoretically that a large-bowel segment would absorb more because this is its normal function, but some observers have declared that there is greater absorption from an ileal segment. Lapides,[2] on the other hand, has shown that hyperchloremia and acidosis are dependent upon the degree of kidney function rather than the degree of bowel absorption. Normal individuals given urine enemas did not develop electrolyte imbalance because the kidneys could accommodate the greater load imposed by reabsorption, whereas patients with kidney disease did develop electrolyte imbalance after urine enemas. This explains why some patients with uretero-intestinal implants develop electrolyte imbalance early, some late, and some not at all. Patients with normal kidney function excrete the reabsorbed electrolytes and do not develop imbalance. Patients with poor kidney function due to ureteral obstruction, infection, or both, develop electrolyte imbalance early. If the implantation causes improvement in the kidney function, the imbalance tends toward normal again. Patients who develop imbalance late, do so because kidney function gradually deteriorates due to stenosis or infection. This concept seems to indicate that whether large- or small-bowel segments are used is less important than other considerations.

Preparation of the Bowel Segment. Two usual misconceptions must be dispelled before proceeding further with this discussion. First, there is no thought of creating a cystic retaining receptacle such as the bladder.[3] The isolated bowel segment is used entirely as a means of avoiding cutaneous ureterostomy and wet colostomy with their attendant complications. The bowel seg-

ment need not be large, as it never need accommodate several hundred milliliters of urine. In fact, such accumulation is undesirable. Second, there is no spincter control of the bowel segment and no periodic emptying. Consequently, it makes little difference in which direction the peristaltic activity functions in the segment, so that reversal of the segment to slow up drainage has no advantage and may simply twist the mesentery, jeopardizing blood supply.

Ordinarily it is safe to generalize that the simplest procedure which will accomplish the desired result is the best. Therefore, it seems unnecessary to use the cecum and terminal ileum as bladder and venting tract, as advocated by Bricker and Eiseman.[4] This is a procedure of much greater magnitude than the circumstances usually warrant. Use of an ileal segment entails division of small bowel in two places, end-to-end anastomosis, closure of one end of the isolated segment, implantation of the ureters, and exteriorization of the free end of the segment. Since the rectum is being removed as part of the original operation and the large bowel must be divided anyway to form the permanent colostomy, it is simpler to avoid all of these procedures on the small bowel. We advocate use of a sigmoid segment in the following manner. The sigmoid colon is divided at a level consistent with safety from the standpoint of the tumor. The distal end then is brought to the skin surface and the sigmoid is measured for length so that it extends without tension somewhat to the right of the sacral promontory. This marks the site for division of the colon to form the distal isolated loop. The proximal point of division now becomes the colostomy stoma, the proximal end of the isolated segment is closed by inversion, and the distal end becomes the urinary stoma (fig. 1). Care must be taken to see that blood supply is not compromised, that the isolated segment is not under tension, and that it will allow implantation of the right ureter readily. The ureter must not be stripped from its bed for any appreciable distance because this interferes with its blood supply and peristaltic function. Also, the ureter must not stretch like a violin string across the peritoneal cavity to serve as a point for bowel obstruction. Finally, a clamp is left on the colostomy for from 48 to 72 hours, but the urinary stoma can be left open, with a soft catheter for sump drainage. If desired, primary application of a rubber ileostomy device is feasible and acceptable.

Technic of Bowel-Ureter Anastomosis. Ureterosigmoid anastomosis has given poor results in the past because of obstruction and ascending infection. Many operative procedures have been devised to overcome these defects and essentially, most of them have attempted to promote obliquity of anastomosis between the ureter and bowel. It should be noted that naturally one structure

traverses the wall of another in an oblique fashion. This prevents reflux and reduces the area of weakness in the wall. In almost every instance where operative procedures do away with this obliquity, difficulty from reflux, ascending infection or herniation result. This has been the story in ureter-bladder implantation, in common bile duct-bowel anastomosis, and even in inguinal hernia repair. Appreciation of this concept led to

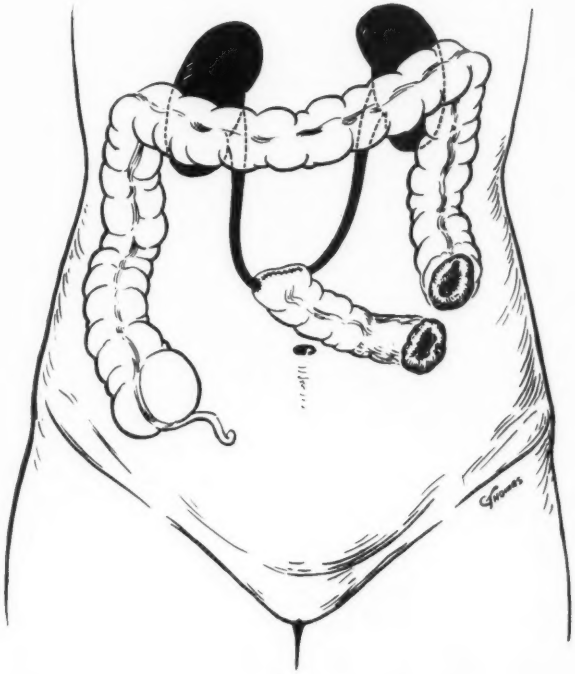

Figure 1. Diagram showing anatomic relation of ureters, sigmoid segment used as bladder substitute, and urinary and colostomy stomata.

the procedure of forming a tunnel in the sigmoid wall proximal to the point of ureteral implantation but this often led to stenosis and obstruction. If the ureters are to be implanted into an isolated bowel segment without fecal stream, such reflux is not a factor and obliquity therefore is not necessary in this instance. Another point of difficulty has been stenosis at the stoma from failure to use mucosa-to-mucosa anastomosis. Cordonnier[5] has emphasized this and his technic is advocated. This consists of several interrupted fine stitches of full wall of ureter and

mucosa of sigmoid. A second layer is made by suturing serosa of sigmoid to adventitia of ureter to make a snug but not tight closure. This anastomosis must be watertight but not constricting. Such a mucosa-to-mucosa closure promotes accurate healing and decreases stricture formation. Finally, it should be emphasized again that one must bring bowel to ureter rather than ureter to bowel.

Location of Stomata. As in ileostomy for ulcerative colitis or colostomy for carcinoma, it is important to locate the stoma in such a way that bony prominences are avoided and that the bag appliances can be worn as inconspicuously as possible. This means that the lower abdominal quadrants between umbilicus and iliac crest are preferred. If a colostomy and a small-bowel bladder substitute are used, symmetrical points on right and left are acceptable. However, if a sigmoid isolated segment is preferred, the urinary stoma must emerge on the left side. It seems best to make the colostomy on the left and then to place the urinary stoma sufficiently below it to allow room for the ring of the bag. This does not make too much bulk even though both stomata are in the left lower quadrant.

Mechanics of Emptying. Since the bowel segment is to serve as a channel for discharge of urine rather than as a retaining cavity, it is essential to see that drainage is not impeded. Necessarily, gravity is the most important factor, and with the patient upright, a not too redundant segment drains naturally. Too long a segment allows collection of urine which by its weight may obstruct the loop. It may be necessary to attach the middle of the segment to the abdominal wall but this poses a problem in obviating the loop itself as an axis about which loops of small bowel may twist. Probably, care in getting the segment of proper length is the best safeguard. Peristalsis is another factor in promoting drainage and again, since collection is not the desired end, it is not advisable to reverse the loop to slow drainage.

We recently have had occasion to do a celiotomy upon one patient, two years after exenteration. We found the ureters slightly dilated, but otherwise normal in appearance. The sigmoid segment had the appearance of normal bowel.

SUMMARY AND CONCLUSIONS

The possible methods of management of the ureters, assuming excision of bladder and rectum to be necessary, are cutaneous ureterostomy, wet colostomy, and bowel segment substitute. Bilateral cutaneous ureterostomy may be indicated in the seriously ill and in patients with hydro-ureter, urinary tract infection, and impaired kidney function, but is a poor method for definitive

choice. The wet colostomy favors serious ascending infection and obstruction of the ureter with added danger of infection and decreased kidney function, and offers a much greater surface for urinary reabsorption. There seems to be little occasion for its use. Use of an isolated sigmoid segment is simple and obviates most of the serious complications inherent in the other methods. Our personal experience embraces the various methods described, and although it has been too small to be of statistical value, we prefer the isolated sigmoid segment.

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Females outnumbered males for the first time in the Census of 1950, but by only 1 per cent. This margin, it is estimated, will grow to 3 percent by 1975. This trend will reflect the rapid rise in the excess of females over males at the ages 45 and over. At ages 45-64, females will exceed males by more than 10 per cent in 1975; at ages 65 and over, the excess will be about 40 percent.

—*Statistical Bulletin*
Metropolitan Life Insurance Company
p. 6, Mar. 1955

CARCINOMA OF THE ESOPHAGUS

Survival, and the Fallacy of "Early Diagnosis"

EDDY D. PALMER, *Lieutenant Colonel, MC, USA*

THE discouraging results of treatment of esophageal carcinoma are largely due to the inherent nature of the tumor, and as yet little can be done to change that. This is merely a statement of the concept of "biologic predeterminism," as emphasized by Macdonald and Kotin[1] in connection with the limited curability of gastric carcinoma. Almost all of those who write and advise on the subject not only emphasize the importance of early diagnosis above all else but offer it as the solution for currently unsatisfactory surgical results. It would be ideal, they say, if the first subjective hint of trouble would drive the patient to the doctor and if the doctor would then immediately suspect cancer, look for it, and find it.

During a perusal of personally observed cases of carcinoma of the esophagus, it was found that in 16 the tumor either had been discovered prior to development of symptoms or had first caused symptoms while the patient was under active medical surveillance for some unrelated disease. The present report describes experiences with these ideally "early" cases.

DETECTION

The basic information on the 16 cases is given in table 1. In spite of the briefness of the courses, detection and identification of the esophageal disease posed no problem. There was no diagnostic delay due to smallness of the lesions. Four patients were asymptomatic as far as the esophagus and carcinoma were concerned, their tumors having been unexpectedly discovered during roentgenologic (2 patients) or esophagoscopic (2 patients) examination, carried out for study of cirrhosis, pernicious anemia, or cardiomegaly. Among the patients who developed clinical manifestations before the tumor was found, the interval between the physician's cognizance of the first manifestation and detection of the tumor amounted to no more than nine days. Nine patients were under hospital care at the time the first manifestation of esophageal cancer appeared and three were being followed closely as outpatients. In two in-

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TABLE 1. *Basic information on 16 cases of esophageal carcinoma*

Case	Age	Primary diagnosis	Type and length of supervision	Circumstances leading to esophageal study	Treatment	Survival (mo) after detection	Cause of death
1	70	Hypertension, heart failure	Outpatient 7 years	Dysphagia	Support	7	Metastatic carcinoma
2	70	Degenerative psychosis	Hospital 3½ years	Attendants noticed regurgitation	Nonresectable, 4,000 r radiat.	8	Metastatic carcinoma
3	63	Gastric ulcer	Outpatient 3 years	Dysphagia	Resection	31	Mediastinal recurrence
4	56	Schizophrenia	Hospital 1 year	Attendants noticed regurgitation	5,000 r radiat.	8	Mediastinal carcinoma
5	75	Repair of inguinal hernia	Hospital 2 weeks	Postoperative dysphagia	Nonresectable, 6,074 r radiat.	7	Metastatic carcinoma
6	74	Pneumonia	Hospital 3 weeks	Persisting chest pain	Resection	¼	Necrosis of suture line
7	70	Resection of prostatic carcinoma	Hospital 6 weeks	Postoperative dysphagia	Resection	48	Mediastinal carcinoma
8	70	Cirrhosis	Hospital 2 weeks	Search for varices	6,216 r radiat.	5½	Metastatic carcinoma
9	73	Pernicious anemia	Outpatient 3 years	Search for gastric cancer	4,600 r radiat.	4½	Mediastinal carcinoma
10	58	Hypertension, heart failure	Outpatient 3 months	Study heart configuration	Nonresectable, 6,000 r radiat.	16	Metastatic carcinoma
11	58	Cirrhosis	Hospital 2 weeks	Search for varices	3,000 r radiat.	10	Hemorrhage from varices
12	71	Stroke	Hospital 4 weeks	Dysphagia, chest pain	Support	9	Metastatic carcinoma
13	68	Parkinsonism	Outpatient 7 months	Regurgitation, choking	Resection	¼	Aspiration pneumonia
14	84	Carcinoma of prostate	Hospital 1 month	Dysphagia	Resection	3½	Mediastinal carcinoma
15	79	Myocardial infarction	Hospital 4 weeks	Dysphagia	Gastrostomy	15	Inanition
16	71	Carcinoma of larynx, resected	Hospital 2 weeks	Dysphagia	Nonresectable	9	Metastatic carcinoma, larynx

stances the first sign of trouble was detected by ward attendants when they noticed at mealtime that two mental patients were having difficulty in swallowing. Two patients developed dysphagia shortly after an operation carried out under general anesthesia. The circumstances surrounding detection of the lesions in the other cases are shown in the table.

DIAGNOSIS

All of the patients were examined roentgenologically, and all but patient 16 were examined esophagoscopically. In one patient the first roentgenologic study revealed no evidence of esophageal disease, although esophagoscopic examination did, but in the others carcinoma was either diagnosed or suspected with a fair degree of assurance at initial study. The degree of tumorous involvement was extensive in some patients (fig. 1), and in patients 2, 4, and 15 there was a high degree

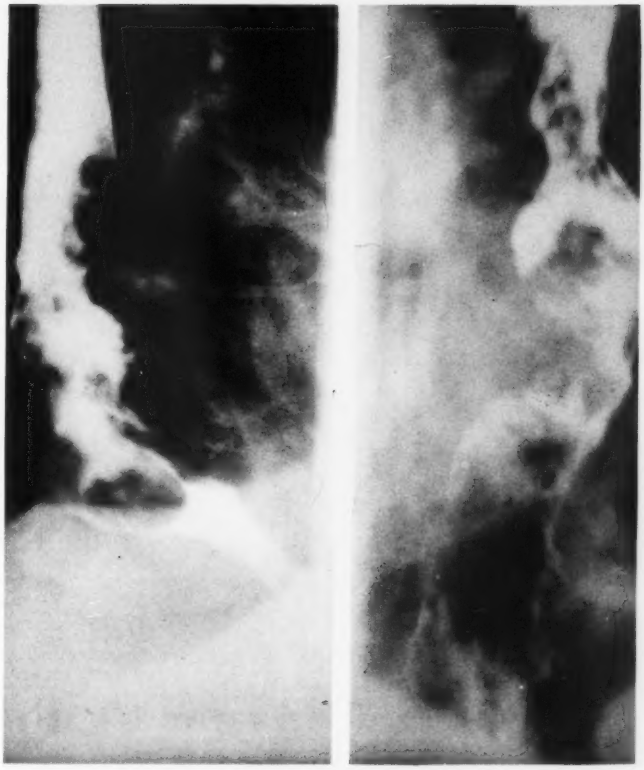

Figure 1. Extensive fungating squamous cell carcinoma of distal esophagus, as it appeared five days after the first complaint of dysphagia (patient 3).

of narrowing (fig. 2). One of the tumors involved the proximal one third of the esophagus; 7, the middle one third; and 8, the distal.

The initial esophagoscopic study of 15 patients resulted in the gross diagnosis of carcinoma in 14 instances; in the other the procedure was unsatisfactory for a diagnostic opinion. Tissue for biopsy study was obtained at the first examination in 13 patients; 9 specimens revealed squamous cell carcinoma, 2 showed only esophagitis, and 2 were pieces of normal mucosa. Tissue taken at a second esophagoscopic examination in these last four showed squamous cell carcinoma in all. Washings for cytologic study were obtained from the patient whose esophagoscopic examination was unsatisfactory, and these were positive for carcinoma.

Figure 2. On the first examination, seven days after the first complaint of dysphagia, this high degree of tumorous narrowing of the distal esophagus was found (patient 15).

TREATMENT

Seven patients, including 3 of the 4 whose carcinoma was discovered by chance during the asymptomatic period, were considered inoperable at the time the lesion was detected. Resection was found possible in only 5 of the 9 who were

operated upon. Three of the resected tumors involved the distal one third of the organ; and 2, the middle one third.

Seven patients were given deep radiation therapy, as shown in the table. Peroral dilatations were freely used, as indicated, whatever other treatment was given. Gastrostomy eventually became necessary in one patient, in spite of dilatations.

SURVIVAL

As can be seen from the table, the courses in general were short, and the cause of death in all but patients 11 and 16 was the esophageal carcinoma. Two patients died shortly after resection. Only 4 survived a year following detection of the tumor, and only 2 were alive at the end of the second year. All but patient 9 were studied at necropsy, and it was found that at the time of death there were no gross distant metastases in 8 patients.

COMMENT

This little series theoretically offered as favorable esophageal carcinoma material as one can hope to manage, using the currently available diagnostic approach. It is true that the coexisting disease influenced the operability rate to a certain extent, although this rate (56 per cent) was quite comparable to that observed in many large reported series.[2] It would not be particularly fruitful to compare the survival in this "early" group with that of the more usual type of esophageal carcinoma case. Poor results are poor results, and no encouragement for the esophageal carcinoma matter can be found in the present experience.

As long as surgical extirpation must be relied upon for hope of cure, a diagnostic approach which depends for its initiation on recognition by the patient that something is wrong is entirely inadequate. No one can doubt that early diagnosis is better than delayed diagnosis, but it is clear that by the time the first symptoms of esophageal carcinoma appear the great majority of patients are beyond surgical cure. Kiviranta[3] is one of the very few authors who have been realistic on this point. After studying the records of 3,756 patients who died of esophageal carcinoma in Finland, he concluded, "The life expectancy in patients subjected to treatment had no relationship whatever to the length of the symptomatic period prior to therapy. This is probably due to the fact that the tumor is as a rule diagnosed only after having reached a certain size inducing dysphagia, and the life expectancy of such patients is generally equally long, nor is radiotherapy able to affect it." This is an especially significant statement, not only because Kiviranta is an important authority but also because it shows that, when put to the test with a large number of routine cases, the concept of salvage through "early diagnosis" is meaningless.

It is not being suggested that surgical resection be abandoned as treatment, however impotent it proves for cure, because it furnishes two important palliative benefits. First, whether or not the removal of a primary tumor ever slows the growth of metastases, in the case of esophageal carcinoma a remarkably large proportion of patients die from the local effects of the primary tumor itself, regardless of metastases, and many die with no gross evidence of metastasis at all. Second, the most distressing subjective feature of the disease and one which in the absence of prophylactic effort is almost inevitable with long survival is esophageal occlusion. Resection of high-lying carcinomas is too hazardous to justify it for any purpose other than intended cure, but limited distal resections, when followed by peroral dilatations, often prove of inestimable usefulness through preclusion of obstruction.

But it is important not to confuse little advancements with solutions. There is nothing about the present and rather unimaginative therapeutic approach to esophageal cancer to warrant more than mild interest until a better line of attack is found. Therapeutic sights must be set much higher than they are at the moment. Finding technologic means for extirpating portions of the esophagus and re-establishing continuity has clearly not solved the problem of esophageal carcinoma, as far as cure is concerned. The danger is that continued effort, money, and, especially, thinking may be expended in exploring the same dead-end path rather than on the obviously more productive possibilities of serodiagnosis and chemotherapy.

SUMMARY AND CONCLUSION

Esophageal carcinoma was detected in 16 patients either before it had produced symptoms or immediately afterward. A brief review of the therapeutic results in these patients discloses the inadequacy of "early diagnosis," as the term is now used, as an answer for the discouraging problem of esophageal carcinoma. Surgical extirpation can increase the patient's comfort and perhaps his period of survival, but it proves wholly inadequate as realistic therapy. It must be concluded that to be successful, treatment of esophageal carcinoma either must be accomplished long before the lesion has made its presence clinically apparent, or it must be of such a nature that it will destroy cancer tissue everywhere throughout the body all at once.

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RUPTURE OF PREVIOUS CESAREAN SECTION SCAR IN SUBSEQUENT PREGNANCIES

Report of Seven Cases

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RUPTURE of the pregnant uterus in patients previously subjected to cesarean section occurs rather infrequently. According to Brierton,[1] it is seen in only 3 per cent of such patients.

Opinion varies concerning the proper course to follow when confronted with the management of a patient who has had a cesarean section. Some clinics adhere to the old adage "once a cesarean always a cesarean," while others strongly advocate a trial of labor provided certain criteria are met.[2,3]

Concerning the best method of cesarean section, most investigators state that the lower segment procedure affords the safest prognosis, both because the scar is less likely to rupture while the corpus is enlarging during a subsequent pregnancy and because the low transverse cervical scar allows a greater margin of safety in subsequent labors, should the vaginal route be elected for delivery.[3-5]

Gross fetal and neonatal mortality associated with cesarean section has been reported as being higher than that associated with vaginal delivery,[6] and with present day improvements in management of surgical emergencies and the relative infrequency of uterine rupture, especially in lower segment scars, it may not be absolutely contraindicated to consider a trial of labor in selected cases. Schmitz and Gajewski,[7] Eastman,[4] and others[1,5,8] have reported individually regarding this problem.

The decision to employ vaginal delivery in a case with a history of cesarean section can only be made after a thorough assessment of the integrity of the scar.[7] The absence of tenderness and morbidity following operation does not necessarily guarantee a firm union nor complete protection from possible rupture.[5] The status of the uterine scar could be fairly well assessed through hysterography. but this method obviously is of no help

Presented at Armed Forces Obstetrics and Gynecology Seminar, 13 April 1956, Walter Reed Army Medical Center, Washington, D. C.
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during pregnancy.[5,7] It appears, therefore, that no absolute or precise means of estimating the integrity of cesarean section scars is presently available, as is emphasized in recent publications by Watt[9] and others[8].

When a uterus does rupture before or during labor, fetal mortality is high, as reported by several investigators.[10,11] A study of fetal mortality in 1,219 cesarean sections at Tulane several years ago revealed a 5.7 per cent incidence.[12] When all the cases were analyzed from the standpoint of indication for abdominal delivery, however, it was noted that the greatest incidence of fetal wastage occurred in the group that contained all the toxemias, placental separations, placenta previas, diabetics and other miscellaneous complications of pregnancy. The remaining cases were uncomplicated elective repeat cesarean sections, and accounted for a fetal mortality of only a little more than 1 per cent. This compares favorably with the over-all incidence of fetal and neonatal mortality resultant from vaginal delivery. The fate of the infant then, as well as of the mother, is an important consideration to be resolved by the obstetrician when he considers vaginal delivery over repeat cesarean section as a routine policy.

This study critically evaluates our own past experiences concerning this problem. From an analysis of the cases reported, recommendations are made as to the safest procedure for both mother and infant to follow when confronted with the alternative of performing repeat cesarean section or vaginal delivery.

The charts of all patients undergoing cesarean section at this hospital for any cause from 1 January 1949 through 31 December 1956 were analyzed from the standpoint of over-all incidence of cesarean sections, total repeat cesarean sections performed, total number of uterine ruptures, and actual maternal and fetal mortality intimately associated with vaginal delivery in patients previously subjected to a cesarean section. During the period studied, there were 29,605 deliveries, of which 818 (2.8 per cent) were completed by cesarean section. The indication for operation in 499 (61.0 per cent) of the 818 patients was previous section. Ruptures of the pregnant uterus occurred in 7 (1.4 per cent) of the 499 patients in the previous section group. There were 1 maternal death and 5 fetal deaths in the 7 cases, an incidence of 14.3 per cent and 71.4 per cent, respectively. The latter figure is in sharp contrast to the average monthly gross fetal mortality per 100 live births of 2.0 to 2.5.

The following case reports of the 7 patients with rupture of the pregnant uterus are summarized in table 1.

TABLE 1. *Summary of seven cases of rupture of the pregnant uterus in patients who had previously been delivered by cesarean section*

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7
Age in years	34	32	25	34	31	33	40
Gravida	2	3	2	4	4	2	7
Para	1	1	1	1	3	1	3
Weeks pregnant	36	40	38	37	23	30	32
Previous section	Classical	?	Vertical low cerv.	Classical	Classical	Classical	Low cervical
Hours in labor	?	4	2	-	-	-	1¼
Method of delivery	Abdominal	Abdominal	Abdominal	Abdominal	Abdominal	Abdominal	Vaginal
Operative treatment	Porro cesarean section	Supra cerv. hyster. bilat. S & O	Repair low segment vert. tear	Low cerv. cesarean, sect. and ligat.	Porro cesarean hyster.	Total hyster.	Total hyster.
Interval between rupture and laparotomy	Over 4½ hours	1½ hours	30 minutes	2½ hours	2 hours	48 hours	2 hours
Extent of rupture	Two places on old scar	Complete	Complete	Incomplete	2 tears in old scar	Incomplete	Tear in lower seg.
Maternal mortality	-	-	-	-	-	-	+
Fetal mortality	-	+	+	-	+	+	+
Postoperative course	Normal recovery	Normal recovery	Normal recovery	Normal recovery	Developed pelvic & subdiaphrag. abscess; discharged after 48 days	Developed wound dehiscence; required secondary closure	Died 3½ hr after surg. from shock & bleeding diathesis

CASE REPORTS

Case 1. A 34-year-old white woman, gravida 2, para 1, had previously had a cesarean section at another hospital. The date and the indication for section were not known. At about the thirty-sixth week of her present pregnancy she was admitted to this hospital with a complaint of lower abdominal pain. A diagnosis of ruptured uterus was made. At laparotomy it was noted that the uterus had ruptured partially in two separate sites. A Porro-type cesarean section was carried out and the patient was successfully delivered of twin male infants, both of whom lived. Convalescence was uneventful.

Case 2. A 32-year-old white woman, gravida 3, para 1, had had a cesarean section 4 years previously at another hospital. The indication was not known and the type of section was not mentioned in the operative report. The patient entered this hospital on her estimated date of confinement, but was sent home as a case of false labor the following day. Five days later she was readmitted with irregular abdominal pains and was kept under observation. The next day she was examined vaginally and found to be at Station +2 and dilated to

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2 cm. The membranes were ruptured. Four hours later the fetal heart tones disappeared and bright red bleeding began. A diagnosis of ruptured uterus was made and a laparotomy was performed. The dead fetus and the placenta were found lying free in the peritoneal cavity. Supracervical hysterectomy and bilateral salpingo-oophorectomy were performed. Convalescence was uneventful.

Case 3. A 25-year-old white woman, gravida 2, para 1, had had a low cervical cesarean section for premature separation of the placenta two years previously at another hospital. It was elected to give the patient a trial of labor. At 38 weeks, she was admitted to the delivery room after having had mild abdominal contractions for about 10 hours. On admission, contractions were 3 minutes apart and strong. Tenderness was noted in the scar area, and fetal heart tones were questionably heard in the right lower quadrant of the abdomen. Continued observation was recommended. Two hours after admission, a diagnosis of ruptured uterus was made. A laparotomy was performed, and a dead fetus and the placenta were found lying free in the peritoneal cavity. A midline lower segment rupture of the uterus was repaired. Convalescence was uneventful.

Case 4. A 34-year-old white woman, gravida 4, para 1, had been delivered 3 years previously at another hospital by a classical type cesarean section for placenta previa. Prior to this, she had had 2 vaginal deliveries. It was decided that she should have a trial of labor. At 37 weeks, the patient noted sudden onset of hypogastric pain, which became increasingly more severe. Physical examination revealed tenderness in the scar area. Fetal heart tones were of good quality. A diagnosis of ruptured uterus was made and a laparotomy was performed. An incomplete rupture was found in a classical scar. A living infant was delivered via a low cervical section, and bilateral tubal ligation was carried out. Convalescence was uneventful.

Case 5. A 31-year-old white woman, gravida 4, para 3, had been delivered 5 years previously at a hospital on Saipan via classical cesarean section "for breech presentation." At about 23 weeks of gestation, the patient noted a sudden severe lancinating abdominal pain when she attempted to lift a heavy object. She was admitted in shock, and after improvement in her blood pressure a laparotomy was performed. There were 2 rents in the old scar and about 1,500 to 2,000 ml of blood in the peritoneal cavity. Cesarean section followed by a supracervical hysterectomy was performed. The fetus was dead. The postoperative course was stormy; vaginal drainage of a pelvic abscess and incision and drainage of a subdiaphragmatic abscess had to be carried out. The patient was discharged after 48 days of hospitalization.

Case 6. A 33-year-old white woman, gravida 2, para 1, had had a delivery by abdominal hysterotomy at 6½ months' gestation at another hospital 4 years previously. The indication was unknown. The present pregnancy was uneventful until 30 weeks, when the patient entered

the hospital with a complaint of nausea, vomiting, and abdominal pain for the preceding 48 hours. The preoperative diagnosis was ruptured uterus with small bowel obstruction incident to hemorrhagic irritation of the peritoneum. At laparotomy it was noted that the uterus had ruptured along a classical cesarean section scar and that a dead fetus and the placenta were lying free in the peritoneal cavity. A total hysterectomy was performed. Postoperatively, the patient suffered a wound dehiscence that required secondary closure.

Case 7. A 40-year-old white woman, gravida 7, para 3, abortus 3, had been delivered 2 years previously at this hospital via a low cervical cesarean section for central placenta previa. The present pregnancy was complicated at about 32 weeks' gestation by vaginal bleeding and ruptured membranes. Because the baby was premature, the preceding cesarean section had been performed at this hospital, and conditions were considered ideal for the procedure, vaginal delivery was elected. After 75 minutes of labor, during which a small amount of bleeding was noted, the patient was delivered via low forceps under pudendal block anesthesia. During delivery, vaginal hemorrhage became profuse. The infant's condition was critical at birth, and it died shortly afterward in the nursery.

The placenta was manually removed and exploration of the uterine cavity revealed adherent placental fragments in the cornual area. The previous section scar was thought to be intact. Because the patient had bled so profusely and shock had occurred, the uterus was packed and transfusions were expedited; however, when the blood pressure rose, bleeding again became profuse. After 2 hours of this heroic type of treatment, a laparotomy was performed. No blood was found in the peritoneal cavity, but there was a tear in the lower uterine segment in the region of a lower segment scar near the uterine bundle and the cardinal ligament on the left. A total hysterectomy was performed.

After the operation, the patient responded briefly, then commenced bleeding from orifices and mucosal surfaces. Despite more blood transfusions and fibrinogen therapy, she died 4 hours later.

FETAL AND MATERNAL MORTALITY

As mentioned previously, rupture of the pregnant uterus carries with it an increased incidence of fetal mortality. Table 2 which lists pertinent statistics from this hospital and several other institutions, shows that we have the highest fetal mortality and second highest maternal mortality directly attributable to rupture of the pregnant uterus. This situation would, at first, seem to be a direct result of the policy followed at this hospital of vaginal delivery in selected cases of previous cesarean section. Close study of table 1, however, will not substantiate this interpretation. Only 3 patients out of the 7 were allowed to go into labor, and only 1 was delivered electively by the vaginal

TABLE 2. *Incidence of rupture of uterus and of associated maternal and fetal deaths at various large obstetrical centers*

Hospital	Years	Total deliveries	Number of ruptures	Deaths in rupture cases	
				Maternal	Fetal
Long Memorial, Atlanta, Ga.[3]	1946-51	28,678	6	0	2
Medical College of Va., Richmond, Va.[12]	1932-49	35,253	7	0	4
Cook County, Chicago, Ill.[5]	1928-47	92,226	9	2	6
Sloane Hospital for Women, Bellevue, St. Vincent's, King's County, and Lincoln; all in New York, N. Y.[2]	1932-47	111,753	26	1	12
Lewis Memorial Maternity, Chicago, Ill.[13]	1931-50	36,293	6	0	2
Women's Hospital of St. Luke's, New York, N. Y.[11]	1921-52	57,167	22	0	7
U. S. Naval Hospital, San Diego, Calif.	1949-56	29,605	7	1	5

route. Our single maternal death did, however, occur in the 1 case allowed to deliver vaginally. Perhaps this would decisively influence our thinking concerning the problem of repeat section versus vaginal delivery were it not for the fact that during the period studied several carefully selected patients who had had previous cesarean sections were safely delivered vaginally in our hospital.

DISCUSSION

Many investigators have emphasized the increased safety and decreased danger in performing cesarean section in recent years.

[5,9] The mortality of cesarean section has been reported by several large obstetrical centers to be in the neighborhood of 0.3 per cent.[5,6] We must remember, however, that 200 maternal deaths a year in the United States are attributed to rupture of the uterus.[13] Brierton[1] reported that 50 per cent of uterine ruptures occurred in the scars of previous sections; of the remainder, 20 per cent were incident to trauma during obstetrical manipulation and 30 per cent were accorded a miscellaneous etiology. Harris[14] reported a maternal mortality incidence of 0 to 11 per cent in the series of Schmitz and McLane. In our own series we sustained 1 maternal death in 7 ruptures, an incidence of 14 per cent (table 2).

Fetal mortality associated with rupture of the uterus is exceptionally high; 71 per cent occurred in our own series. The incidence of uterine rupture averages about 3 per cent in women who have had a previous cesarean section. The relative safety of the low cervical operation, which is supported by most obstetricians,[4,7] is probably open to question, as there is no foolproof method available to assess the strength or integrity of the scar. This fact must be known if delivery is to be safely accomplished through the vagina.

On the other hand, maternal mortality in the elective cesarean section patient statistically approaches that of vaginal delivery.[6,12] Fetal mortality associated with elective cesarean section and corrected for the complications of pregnancy that do not necessarily attend such an elective section, approaches that of fetal mortality accompanying vaginal deliveries.[12]

In view of the evidence collected, we believe that a trial of labor in the case of a woman who has had a previous cesarean section is definitely a gamble and should not be attempted unless the following criteria can be satisfied: (1) there is no demonstrable cephalopelvic disproportion, (2) the previous cesarean section was of the low transverse segment type, (3) there was no morbidity following the previous section, (4) there is no malpresentation in the present pregnancy, (5) there is no demonstrable scar tenderness, (6) the patient will be attended by an obstetrician throughout her labor, (7) sufficient blood will be available for instant use if required for transfusion, (8) an operating room and team will be available in the event of rupture, and (9) the patient thoroughly understands and accepts the added risk involved. This leads to the inevitable conclusion that the safest method of delivery for the previously sectioned patient is by low transverse cervical cesarean section near term.

SUMMARY AND CONCLUSIONS

Analysis of 29,605 deliveries in this hospital during an 8-year period showed 7 cases of obstetrical rupture of the uterus

following previous cesarean section, with 1 maternal death and 5 fetal deaths.

Review of the literature reveals considerable frequency of uterine rupture and of related fetal and maternal mortality.

A margin of safety is afforded both mother and child by present-day cesarean section, whereas important criteria must be satisfied prior to carrying out vaginal delivery in a previously sectioned patient and methods of evaluating the scar for a trial of labor are far from satisfactory.

Repeat cesarean section near term is strongly recommended as a routine obstetrical policy in the majority of cases.

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RADIATION HAZARDS AND MEDICAL X-RAY PROTECTION

In Installations of the U. S. Army, Europe

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THE HAZARDS of ionizing radiations, in general, and those attendant to many routine x-ray procedures, in particular, have only recently been receiving the consideration they deserve. Laymen, as well as most doctors and dentists, still do not fully appreciate these hazards. Through the years many radiologists and x-ray technicians have ignored sound principles of safety. They have lived to regret it. At the Saint George Hospital in Hamburg, Germany, there is a monument in memory of persons known to have died through use of roentgen rays. One hundred ninety-nine names are inscribed, and at least three more remain to be added.

RADIATION AND LEUKEMIA

It is only in the incidence of leukemia[1] that the effect of small quantities of radiation have to any extent been adequately studied. The incidence of this disease is almost twice as great in physicians as in the general adult population, and the incidence in radiologists is over nine times as great as in non-radiologic doctors. The increase in incidence in physicians results mainly from the inclusion of radiologists in the statistics; when they are excluded, the slight increase may well be accounted for by the non-radiologists who use fluoroscopes, x-ray machines, radium or radioactive isotopes. A study of the causes of death in dentists, x-ray technicians and others using x-ray or radioactive materials would probably show similar startling statistics.

INCREASE IN RADIATION HAZARDS

The ever-increasing use of x-rays for medical diagnosis and therapy, to say nothing of the use of radioactive materials as

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Reprinted from *Medical Bulletin of the U. S. Army, Europe.* 13: 128-132, June 1956.

a source of power and in the manufacture and testing of nuclear weapons—with the attendant accumulation of waste material and the effects of fallout—are rapidly increasing the radiation hazard and distributing it to the general population. The possible genetic effects on human beings of large doses of radiation are being carefully studied, but the results will not be known for several generations. There is increasing evidence, however, to justify the warnings of many careful observers that the irradiation of members of one generation will cause genetic damage in future generations.

The effects of radiation are often extremely slow in becoming manifest. Changes in the skin of a person's face resulting from small accurately measured doses of radiation used in the treatment of acne may not appear for ten or fifteen years. The painful rodent cancer on the hand of an x-ray machine repairman who occasionally uses that member for testing may not occur for many years after the last exposure. One of the "American Martyrs to Science through the Roentgen Rays,"[2] Dr. William Krauss, died as a result of malignant changes occurring in the skin of his fingers which had been damaged by exposure to x-rays thirty-eight years before. At the age of fifteen a boy developed a marked varus deformity of the left knee, from which a foreign body had been removed fluoroscopically ten years before.

The known dangers of fitting shoes by x-ray have recently begun to receive proper attention. The time it takes for one person to check the fit of shoes by a glance through the x-ray machine is not long enough to present a radiation hazard, even at the close distance and at the high milliamperages required for unadapted eyes. Usually, however, if a child is being fitted, he and his parents, as well as any brothers and sisters present, in addition to the salesman, must see the fitting. The number of feet which have been permanently damaged because of use of these x-ray shoe-fitting machines will never be known since changes are bilateral and may be attributed to other causes. Many of our own states have wisely regulated the use of these machines or banned them altogether.

X-RAY UNITS IN USAREUR

There are well over 100 U. S. Army diagnostic x-ray installations and many dental x-ray units in operation in USAREUR medical and dental facilities. Less than one half of the medical x-ray units are under the constant supervision of a trained radiologist. While many of these x-ray units are well screened and safely operated, others are hazardous, especially to the operators. Screens with no lead glass or with push buttons which are on the "dangerous side" of the screen are examples. In one

heavily loaded installation, when the x-ray machine was operated, 50 mr/hr were reaching the personnel in the laboratory across the hall.

Dental x-ray units are particularly hazardous to the operators and to the occupants of surrounding areas unless shielding is adequate. These units are small and innocent in appearance but are really wolves in sheep's clothing. Because of their very short focal film distances and long exposure times, their use for a full mouth x-ray with no filter and with retakes required may expose the patient's face to an erythema dose. The x-ray beams reach not only the teeth; in addition, the neck tissues with their abundant lymphatics receive heavy doses. Depending on whether or not filters are used and also dependent on the distance, roentgens delivered may vary from 40-270/min.[3] With the latter higher rate one machine delivered *315 r* during a routine full-mouth examination without repeat films. For this quality radiation *350 r* is considered an erythema dose.

For all diagnostic procedures, particularly for dental x-rays and fluoroscopy, external aluminum filters must be employed, 1 mm for radiography and at least 2 mm for fluoroscopy.

HAZARDOUS FLUOROSCOPIC AND X-RAY PROCEDURES

Many fluoroscopic and x-ray procedures are hazardous and must receive careful consideration at all times:

1. *Examinations of the abdomen or pelvis during early pregnancy.* Be sure that the patient is not pregnant before you order lumbar spine films, a GI series, a barium enema, an IVP or fluoroscopic examination of the abdomen.

2. *Multiple films of the abdomen at any time during pregnancy.* Routine pelvimetry by the use of multiple films is of questionable value and may be fraught with danger to succeeding generations, because the examination may need to be repeated to secure adequate information. If there is definite evidence of pelvic deformity by measurement, pelvimetry may be indicated, but its value remains questionable in view of the non-visualized soft tissues. If done, the procedure should be reserved for late pregnancy.

3. *Repeated full-mouth dental x-rays.*

4. *Repeated examinations of a part of the body,* over a period of days, or on a single day during surgery, *e. g.,* a fractured femur for position of the fragments during and after nailing. I am sure many of you have removed a cast and noted that the skin was tanned and peeling. How many have stopped to wonder why the skin would tan while covered by cast?

5. *Prolonged fluoroscopic procedures of any nature,* particularly with the patient remaining in the same position.

6. *Most hazardous to both patient and doctor is the setting of fractures or attempted removal of foreign bodies under fluoroscopic control.* These should not be attempted. During World War II, in one Service Command alone, at least three Army physicians lost fingers and may later die from a one-time performance of such procedures.

SAFETY STANDARDS FOR PERSONNEL AND EQUIPMENT

Personnel engaged in x-ray work must follow safe practices at all times, equipment must be known to be safe, and shielding must be adequate. All diagnostic equipment must be operated only under the supervision of a medical or dental officer, whose duties and responsibilities are clearly defined and outlined in *TB Med 62.*[4] In general, this bulletin sets up these requirements:

1. Equipment must be safe, and shielding must be adequate. Shielding present may not equal or may exceed the requirements of *TB Med 62,* but it must be safe. Stone, cement, plaster and/or lead in adequate quantity are equally efficacious for shielding. The shielding requirements of *TB Med 62* are ideal, are based on *Handbook 41*[5], "Medical X-Ray Protection Up to Two Million Volts," and are designed for use in new construction. Theoretically, all departments should meet these requirements; all new construction must. The Surgeon General and/or the Department of the Army have usually granted relief for old installations when they are found by survey to be safe. The requirements in *TB Med 62* are designed to insure that the dose presently considered safe, .3 r per week, is not exceeded. This rate may be further reduced to 6.25 mr/hr or .104 mr/min for a 48-hour work week with full-time work.

2. A health folder must be maintained for each individual exposed to x-radiation. Into this folder must go:

a. The physical examination record and history report on the person when he starts work in the department, including a chest film report; records of follow-up examinations made yearly.

b. A copy of initial blood counts performed at a stated hour on at least two successive days with repeat examinations if indicated.

c. Copies of blood counts at three or six-month intervals, dependent on whether or not monitoring is practiced afterward. It is of utmost importance in the case of military personnel that a copy of all blood counts be placed in their permanent 201 files for future reference, particularly the repeated original blood

counts made when they started as a radiologist or x-ray technician. Repeated routine blood counts are not all important *if* continuous monitoring is practiced and a detailed permanent record maintained.

d. A statement that the person has read and understands the safety rules of the department.

e A record of the exposure the person has received, as indicated by a monitoring chamber or by actual dental films of check tests showing dates film was worn.

f. A copy of the chest-film report of the person at 6-month intervals.

3. Safety rules must be posted and adhered to. All personnel must understand them.

The following safety rules are used at the U. S. Army Hospital Neubrucke, and are considered sufficiently detailed. They may be expanded when desired.

RULES FOR SAFE OPERATION OF X-RAY EQUIPMENT*

1. Operation of Radiographic Apparatus.

a. A competent operator shall be at the control during any radiographic exposure.

b. When it is necessary to hold the patient during the exposure no person shall be regularly so employed, nor shall anyone from the department of radiology be permitted to perform such service. The person holding the patient should wear lead protective gloves and a lead protective apron. No part of this person's body shall be in the useful beam.

c. No persons other than the patient and those needed to hold the patient shall be in the radiographic room during exposure.

d. Radiographic work shall be performed with the smallest field consistent with clinical requirements. *Always use cones or diaphragms.*

e. All technicians will insure themselves that they are never outside the control booth when an exposure is made unless they are wearing a lead apron and are as far as possible from the tube and patient. *This method of operation will be tolerated only for special procedures such as angiocardiography and cerebral angiography.*

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*Handbook 41 and TB Med 62

2. Operation of Mobile Apparatus.

a. The technician *should* stand as far as possible from the tube and patient during exposure and *shall not* stand in the useful beam.

b. An operator, standing at least 6 feet from the tube and patient, should not make more than 15,000 milliampere seconds of exposure during any one week. This corresponds approximately to the weekly permissible dose. Rotation of operators or wearing of lead protective aprons is required for longer exposures. *For his own protection the technician should always wear a lead rubber apron.*

3. Operation of Fluoroscopic Apparatus.

The fluoroscopic equipment *shall* be operated only by a medical officer of the department of radiology or by a medical officer authorized by the radiologist in charge to conduct fluoroscopic examinations.

a. The fluoroscopist should have completely dark-adapted eyes before proceeding with a fluoroscopic examination.

b. Fluoroscopic examinations *shall* be performed in the minimum time possible, using the lowest x-ray intensity and smallest aperture consistent with clinical requirements.

c. Lead protective aprons *shall* be worn by the medical officer, technicians, and all other personnel within the fluoroscopic room.

d. Lead protective gloves *should* be worn during every examination.

e. The hand of the fluoroscopist either with or without gloves *should never* be placed in the useful beam of radiation.

4. Operation of Therapeutic Apparatus.

a. Only the patient shall be in the treatment room during exposure except when it is necessary to hold the patient, as in the case of small children. *No* members of the radiological staff or other persons normally near x-ray equipment or radio-active materials *shall* hold the patient during irradiation. The person holding the patient *shall not* be in the useful beam and *shall* be protected as much as practicable from scattered radiation.

b. The patient and x-ray control *shall* be under observation during exposure.

c. The useful beam *should* be directed toward unoccupied regions if consistent with therapeutic requirements.

4. Maximum permissible exposures must not be exceeded as stated in tables in TB Med 62. It is the responsibility of the doctor or dentist to know the requirements of this directive and to satisfy himself that they are complied with.

To check how safe an installation is from the standpoint of radiation hazards, dental x-ray film with paper clips or lead numbers attached may be left for one week on all areas presumed to be safe and then developed. An outline of the clip or letter or any blacking of the film indicates an unsafe condition requiring immediate correction. Obvious lack of shielding should be corrected locally. If doubt still remains as to safe conditions, the Maintenance Section, Rhine Medical Depot, should be requested to perform a radiation survey. They do not at present have adequate personnel or equipment to make routine surveys of all x-ray installations.

The Ionization Chamber.

AR 40-414[6] requires continuous personnel monitoring of x-ray personnel by ionization chamber. Chambers and charges are now available as Signal issue items in accordance with Change No. 1, USAREUR Circular No. 720-5, "Allowances of Supplies and Equipment," dated 21 September 1955. Batteries, BA-51 (67½ volts) and BA-30 (1½ volts) are required for use of the chargers, and if they are not available, they should be requisitioned simultaneously. Difficulty may be experienced with the chargers because of damage in shipment. A small wire loop switch connected to the charging button is the usual source of trouble, causing the central electrode to receive continuously charging current regardless of whether or not the charging button is depressed. Instructional material accompanying the charges and chambers is complete and informative. It must be thoroughly understood before the instruments are used. The chambers are usually very stable with regard to leakage, and readings as a rule will not be required more often than once each two weeks after it has been determined by more frequent readings that personnel are following safe practices. High readings may occur if safe practices are dropped. Until chambers are in use, a dental film as described above can serve as a rough estimate of the radiation personnel are receiving. For the technician, there should be no blackening; for a fluoroscopist, a faint outline of the clip or letter in a week is allowed, but he should review his procedures.

SUMMARY

1. Some diagnostic x-ray procedures are hazardous.

2. Every precaution must be taken to reduce such procedures to a minimum.

3. Every physician and dentist using, or supervising the use of, x-ray equipment must be familiar with and comply with the provisions of TB Med 62.

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TREATMENT OF HEPATITIS

"The optimal diet in the treatment of infectious hepatitis consists of about 3,000 calories containing approximately 150 grams each of protein and fat. Intakes above this level should be *ab lib.* Although fried and greasy foods may cause indigestion, the fat contained in meat, eggs, and dairy products is not harmful and adds greatly to the palatability of the diet. During the stage of severe anorexia the patient should be urged to take frequent small feedings. Intravenous glucose solutions should be administered when necessary to maintain a minimal caloric fluid intake. Although the forcing of a high-protein, high-fat diet, by stomach tube if necessary, has been demonstrated to hasten recovery on the average, critically ill patients with fulminating disease or impending hepatic coma may be harmed by excess dietary protein. In these few patients, therefore, it is probably unwise to administer more than a maintenance quantity of protein."

—THOMAS C. CHALMERS, M. D., et al.
in *Journal of Clinical Investigation,*
p. 1214, July 1955

DEVELOPMENT OF A THERAPEUTIC COMMUNITY

Problems Encountered in Daily Community Meetings

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IN A previous article,[1] we dealt with the initial problems encountered in the operational transition of a closed psychiatric ward in an overseas naval hospital from traditional management methods to those embodied in the concept of the therapeutic community as developed by Jones[2] and Wilmer.[3,4] About 6 weeks after the program was initiated, the previously described daily group discussions on the closed ward were extended to include the entire service. The size of the group meetings after the open ward was added reached a maximum of 120 patients and staff.

For several weeks, developments were satisfactory and encouraging, and then a series of incidents occurred that necessitated dividing the community into two separate parts, the closed and open wards. The most important factors involved in this disorganization were the marked heterogeneity of the patient population, premature relaxation of some of the former closed ward restrictions, and a lack of adequate communication between members of the staff and between staff and patients. After about three months it was again possible to establish the service as a total community, and it has been operating as such since that time.

One of the most important results of the adoption of the community method has been the elimination on the closed ward of all forms of mechanical restraint, including seclusion rooms. These have been used during the past five months only for segregation of disturbed drunk patients. The use of sedation on both wards is now rarely necessary, and the ataractic drugs are used only occasionally to control severely anxious and disturbed individuals.

Currently all patients and staff meet for 45 minutes six mornings weekly for the community group meeting. Following each

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meeting, the staff meets to bring together all information available about patients and to discuss the meeting just held. Subsequent to that, the closed-ward patients meet with the ward corpsmen for a second group discussion. In addition, many open-ward patients are assigned to small therapy groups, these being led by the nurse and senior corpsman, under supervision of the medical officers. A few patients are given individual psychotherapy, but the treatment for most is almost entirely within the community setting. In addition to the meetings described, the closed-ward staff meets early each morning to exchange information and observations; and one afternoon weekly the entire staff meets in a group designed primarily for working out staff interpersonal difficulties.

During the period covered by this article, a number of problems arose repeatedly. They will be presented here, together with some of the methods developed to deal with them.

PROBLEMS OFTEN ENCOUNTERED IN COMMUNITY MEETINGS

Here and Now Problems. Jones[2] and Wilmer[3] have pointed out that often the most important material for treatment is contained in day-by-day behavior and the feelings involved in interpersonal relationships. Initially, the importance of dealing with these obvious factors was overlooked; instead, patients were encouraged to reveal and discuss deep inner feelings and ideas. As a result, many opportunities that arose in the frequent interpersonal difficulties were lost. When it became clear that this was the case, the emphasis was shifted and all members of the community were encouraged to bring up the small aggravations, annoyances, tensions, and resentments that arose within the community. In many cases this led to discussion and working through of underlying personal problems, even though they were not primarily emphasized.

Naming Names. In this community there has been extreme reluctance to reveal names of persons discussed, when the behavior involved was in any way antisocial, unacceptable, or could be considered an offense under military law. For instance, a patient may bring up in the group meeting, "There's a patient drinking on the ward, I'm not saying who it is but . . . ." In such a case, he would be interrupted and asked to name the person about whom he was talking. If he refused, he would be discouraged from continuing unless the person involved should speak up. If the person did not speak up, the group would be asked whether anyone could assist in determining who was being discussed. If this failed, the matter would be allowed to drop even though it would seem important that the issue be settled. The exposure of antisocial behavior before the group usually causes embarrassment and discomfort in the individual concerned and resentment to-

ward him by his peers. These factors constitute social pressure, which if handled properly may be used effectively to bring about alterations in behavior patterns. If names are not revealed, this pressure cannot be usefully employed. The staff is also required to identify persons discussed, and many times the patients will call their attention to the need to do so.

Another reason it is believed necessary to name names is to prevent introduction to the group of factually inaccurate information. On one occasion, a 17-year-old youth with a basically schizophrenic make-up, whose constant acting out was provocative and designed to arouse hostilities between patients and staff, asked what would be done if it were learned that narcotics were being brought on the ward. At that time it was not insisted that he make clear what he meant and name those involved; the discussion continued on a hypothetical level, and three patients who were under investigation for narcotics use became extremely angry and disturbed as they believed that suspicion was being cast upon them. Other patients seemed to become angry and anxious about the situation, and it was only after several meetings that all the feelings and tensions had been worked through and the facts of the matter established. Most of the difficulty could have been avoided had the person who introduced the subject been forced to name names or admit that he had no reason to think that narcotics had actually been brought on the ward.

Patients often took the attitude that informing on persons involved in illegal activities would be "squealing" or "ratting" and that this would disrupt friendships and social standing on the ward. Sometimes patients openly interfered with the efforts of the staff to encourage the revealing of such information. In such instances, the staff pointed out that withholding information which aided another to escape detection of antisocial behavior was not helping him in terms of real treatment, which was the object of his hospitalization. Occasionally the example was cited by staff or patients of a patient who a few months before went AWOL and later was found dead of an overdose of heroin. Many patients on the ward knew that he was going AWOL and, in fact, some co-operated with him, but none had alerted the staff. In this instance it was clear that had someone "squealed" it would have been a worthy and constructive action.

When the person named in cases involving socially unacceptable behavior is a member of the hospital staff, it is important to have that person present even though he is not a member of the psychiatric staff. In some instances, staff personnel from other departments, such as the master-at-arms staff, who were named by patients as having been involved, were invited to attend the group meeting, with beneficial results for the com-

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munity and for themselves. In some cases the person named was in such a position that it was impossible to obtain his presence at the discussion; this was one of the disadvantages that was inherent and unalterable and hence had to be accepted.

Confessions. It was found that it often was unwise to allow patients to be "pressured" by the group into discussing a matter of deep personal concern that would be in the nature of a confession, because it would make the person liable to legal proceedings. This problem arose chiefly in connection with sexual matters that under the Uniform Code of Military Justice are illegal, particularly homosexuality and other perversions. In this military setting it was found that it was impossible to deal with such matters therapeutically, because of legal and administrative attitudes, as well as the secondary attitudes that arose from them. In a few instances in which group pressure resulted in confession of material that could not be adequately worked out, the effect on the person involved and the group as a whole was considered to be detrimental. If a staff member realized that a patient was being pushed toward revelation of such personal, highly charged emotional material, the process was interrupted directly.

Legal Entanglements. Related to the problem of naming names and handling confessions was that of what action to take when cases of infraction or violation of laws or regulations arose in the group meetings. The social pressures operative within the therapeutic community were such as sometimes to cause information to be revealed that could lead to legal action and punishment. This arose most frequently in instances of drinking or gambling in the hospital, going AWOL, and financial indebtedness to other patients. In such cases the decision was made individually as to whether taking legal action would be beneficial in terms of conscience development or relief of guilt.

Sometimes the decision as to whether legal action should be taken was influenced by the manner in which the community responded to the situation. It was interesting to see how emphasis on honesty and truthfulness and conformity to social rules and customs sometimes promoted the acceptance of such qualities by patients. Often patients would seek private interviews to reveal their own infractions of rules, knowing full well that to do so was to invite legal action. In the community, it was emphasized that members must face their social responsibilities to the group, and that they should not seek to escape punishment by private revelation of guilt. Sometimes patients on the eve of their departure from the hospital would confess to having committed some illegal act, stating that they just could not leave without "getting it off their chest." On occasion they offered con-

crete suggestions as to how we could help other patients who engaged in such behavior, usually indicating that they believed the staff's attitudes to be too lenient.

Antisocial Behavior. Situations which were indications for legal action have been discussed, but in the therapeutic community problems constantly arose that involved antisocial behavior of a nature which would not justify formal legal action. Examples of such behavior were failing to observe reveille, refusal to perform work details, making noise after taps, and using the property of others without permission. Such matters, although they seem minor, often led to intense friction and hence were the subject of discussion in the large group meetings.

When such behavior was discussed, the offender was first asked if he could explain his actions to the group; then the group was asked to express opinions and feelings. Patients and staff have indicated many times that on occasion they had conformed to rules and social expectations because they dreaded having their actions examined and discussed by the group.

There were certain situations involving antisocial behavior that consistently caused considerable tension and tended to disrupt the community; hence the rules and social requirements were strictly enforced. Examples of such situations were nonattendance at group meetings, gambling, consumption of alcohol within the hospital, and borrowing money. When possible these matters were dealt with within the community, but in some cases legal action was taken. On one occasion a patient was placed on report for deliberately evading attendance of group meetings despite repeated warnings; for this, and the fact that he lied when he appeared at Captain's Mast, he was awarded a court-martial. At that time this action seemed drastic, but in the long run the effect was beneficial to the community and to the patient.

Occasionally antisocial behavior of a staff member on or off the psychiatric service was discussed in the group meetings. In such cases the situation was handled no differently than if it were a patient who was involved, so as to make it clear to staff and patients that the staff as well as the patients were expected to conform to community rules and customs. Once a staff corpsman from another hospital department aided a psychiatric patient in going AWOL and also borrowed money from him. This staff man was invited to attend the group meeting and was asked for an explanation. The patients in general tended to excuse and defend him, but the outcome was that he was placed on report and legal action was initiated.

One of the greatest difficulties in regard to the problem of minor acting-out by patients was a lack of consistency among

the staff corpsmen in enforcing rules. For the most part this has been overcome by an active teaching program and frequent staff meetings, wherein efforts are constantly made to maintain open communication among the staff. Another problem was that the staff corpsmen were reluctant to introduce to the group, information concerning relatively minor antisocial behavior by patients or staff. They seemed to feel that such things were not important enough to warrant the group's consideration. Also, at first, there seemed to be an attitude that this would be "squealing." This problem was gradually overcome as the staff became educated and experienced and felt secure in their position in the community.

Recently it seemed that in the group discussions too much emphasis was being placed on the misbehavior of patients, which led to the attitude among many of the patients that they were being "placed on trial." In retrospect, it appeared that the approach was too moralistic, without sufficient effort to understand why such behavior occurred. When this was realized, a deliberate attempt was made to shift the emphasis. At present it cannot be said which approach was the more useful in the operation of this particular therapeutic community.

The Indefinite Answer. Sometimes patients indicated in the group meetings that they were angry with or disappointed in the staff because questions or issues were not squarely met and answered or settled. In general, questions directed to the staff were reflected back to the person asking them, or were passed on to the group, as often a question was asked primarily as an opening for discussion rather than to obtain a direct answer. Sometimes it was necessary to answer a question directly and concretely. This was so especially with questions concerning psychiatric illnesses, diagnoses, theories, and treatment. In such cases a simple, honest, direct answer was useful in educating patients, in clarifying misconceptions, in allaying anxiety, and in removing the shroud of mystery that so often surrounds such matters.

When a question discussed in a meeting appeared not to have been adequately answered, a staff member would state the issue, summarize the discussion, and give an explanation or answer if possible; if none was possible, he would say so plainly. Often patients remarked, "Why not just say there is no answer, rather than beat around the bush?"

Only the Doctor Can Help Me. An opinion frequently expressed in the discussions was that because most of the group were patients and had problems of their own, it would be futile to introduce personal problems to the group for their consideration and assistance. Another phase of that attitude was the belief, held by most

patients when they came to the hospital, that any help must come from the doctor himself. To many, being a patient involved passively co-operating with the doctor's orders in the hope that relief from distressing symptoms would ensue. Perhaps this procedure would work in some aspects of medical or surgical treatment, but in psychiatry it would be inimical to the treatment process.

When a patient in the meeting brought up his feeling that only the doctor could help him, several approaches were utilized. Obviously there were occasions when the reality situation was such that only individual psychotherapeutic treatment could be expected to give relief, and this was arranged for when possible. In other cases, in which it was believed that the therapeutic community effect would be beneficial, the approach was designed to aid the person in understanding how the community operated and what could be expected if he entered into it. One way of dealing with the problem was for one of the doctors present to call attention to his presence and that of other doctors, and to point out that they were there to help in any way they could. Another approach was to make a simple statement that in the past it had been found that patients could be of great help to other patients. Sometimes it was pointed out that in cases involving difficulties in getting along with people, working them out with the doctor alone would not necessarily ensure that the solutions could be applied outside the individual therapeutic setting. It was pointed out that in some cases the working through of such difficulties in a large group would be more beneficial. Often, patients who had been in the hospital for some time gave "testimonials" that they actually did receive benefit and assistance from other patient members of the group.

From the beginning a deliberate attempt has been made to foster the attitude that patients, as members of the community, have responsibilities in the treatment of other patients. This attitude was developed and perpetuated only by constant and persistent efforts by the staff. An example of a way in which patients shared with the staff in the treatment of a patient was that of a career Navy man who had made a nearly successful suicidal attempt. On the closed ward, under the unobtrusive supervision of the staff, the patients stood "special watches" over him and aided in his nursing care. Later, when this patient was ready for transfer to the open ward, he requested that he be allowed to remain on the closed ward in order that he might share in the treatment of more seriously ill patients and thus discharge his "debt" to the community and show his gratitude to the group. Following extensive surgical repairs and physical therapy, this patient was restored to full duty.

An important part of functioning of the therapeutic community as developed here was that the patients shared directly with the staff the responsibility for care of psychotic patients, especially those who were seriously disorganized. Several patients who were confused, disoriented, agitated, hallucinating, and delusional were cared for by patients in co-operation with the staff in such a manner that these patients were never left alone except when they slept. In some cases, catatonics were "forced" to leave their beds, play games, eat meals, take showers, and shave, through the efforts of the group. They were never abandoned to their private, autistic worlds of fantasy, hallucinations, or delusion. They were faced with reality nearly 24 hours daily, which included their being drawn into social relationships, both individual and group. Sometimes disorganized patients during lucid intervals would adopt this helpful attitude toward others who at the moment were less well than they. In several instances, acutely schizophrenic patients showed dramatic improvement after 2 or 3 days of such treatment, such improvement not having been observed prior to institution of therapeutic community methods. Of course, there were other schizophrenic patients who did not improve. Because of the short time period involved and the lack of follow-up information on these patients, it is impossible to draw any conclusions as to the efficacy of this treatment in terms of the over-all disease process. It is believed, however, that because this treatment was begun within hours or days of an acute psychotic disorganization, with at least interruption of the disease process, the likelihood of its having permanent beneficial effect would be great.

The limitations of community means of treatment are realized, in that emphasis is on social recovery rather than on personality reorganization; however, if the means to do individual interpretive psychotherapy are not available, social recovery is an important achievement and may have equally ambitious goals.

There's Nothing Wrong With Me. Inasmuch as the majority of patients with whom this article deals were admitted to the hospital not because of their own request for aid but because of various external circumstances, there were many who maintained the attitude that there was nothing wrong with them and that they should not be in the hospital. This was in fact true of some patients, and they were returned to duty as soon as possible. Those who were retained despite their belief that it was unnecessary were particularly resistant to acculturation into the therapeutic community, and often attempted to disrupt the group discussions with their insistence that they were perfectly well and should not be in the hospital. This situation was usually recognized by other patients who had been in the community for some time and were

quite skilled at uncovering and pointing out denials, inconsistencies, and rationalizations. When the group did not do this spontaneously, a staff member posed the question, "Does anyone see any reason why this man should be in the hospital?" This usually was sufficient to start the process of dealing with the man's resistances. One of the most effective functions of the community was in demonstrating to nonpsychotics that internal factors often were more responsible for their maladjustment than the external factors they frequently blamed. The psychotic patients who used paranoid thinking presented somewhat the same problem, and in many cases they responded to group processes in such a way that their paranoid systems were either modified or more narrowly delimited. The other patients soon recognized that such persons were very ill, and responded to the staff's requests for assistance in defining reality to them.

Sharing of Feelings by Staff. One of the most difficult problems encountered and one which still remains is that of the staff's reluctance to share their feelings with patients and with each other. It is difficult to know just how much personal information and feelings staff members should reveal in group discussions. In general it is believed that any feelings that, when unexpressed, interfere with any phase of community functioning or relationships should be openly discussed if the occasion arises. Initially, it seemed that the ward corpsmen were reluctant to follow this course, because they saw in it an obliteration of the distinctions between them and the patients. The natural extension of their thought was that they themselves might be considered to be mentally or emotionally ill.

It is not possible in the therapeutic community for the feelings and behavior of any member, including the staff, to be immune from scrutiny, because all are interrelated. This problem has been stated by Jones:

> If the concept of free communication and analysis of current tensions is implicit in the treatment ideology of a therapeutic community, it is difficult to see how the staff can escape the need to face this challenge. A distinction is sometimes made between what is relevant to the treatment situation and what pertains to the individual's private life.[5]

It is not believed that this aspect of this community's functioning has yet been worked out satisfactorily. Recently a change was instituted to require all available staff members to attend all large group meetings and all staff conferences, and it is believed that this was a step in the right direction. Daily staff meetings following the large group meeting are still held, and in addition the closed ward staff meets early each morning. Also

a weekly meeting has been established in which staff members are encouraged and in fact urged to express their feelings about each other freely, or about patients if the feelings constitute a hindrance in their dealings within the community. Progress has been slow insofar as staff members freely expressing feelings about each other is concerned; yet in general it is believed that such an approach is necessary.[6] Recently, in a meeting, one of the enlisted staff corpsmen expressed his personal antipathy toward one of the staff officers present. This was considered to have been a real achievement in terms of the over-all process, because military protocol and training is such that this is not only discouraged but prohibited. The authors consider that the difficulties manifest in this staff's uncommunicativeness are bound up in what might be called a group "transference neurosis" which has developed. It is believed that if this can be worked through, the everyday conflicts and difficulties which arise among the staff will be much less of a problem.

SUMMARY AND CONCLUSIONS

This article reports some of the problems that repeatedly arose in the daily group meetings of a therapeutic community and the methods developed to cope with them. The community is still in a transitional stage, but it is believed that other hospitals will experience similar transitions in adopting community methods of treatment.

Community methods of treatment focus on social tensions existing between patients, between staff members, and between staff and patients. The daily group meetings, seen as teaching and learning situations for good social behavior, have been used to stimulate discussion of interpersonal tensions existing within the community. In the developmental stages of creating such an atmosphere, it was found necessary to deal directly with certain issues that arose frequently within the meetings. We found it necessary to require patients and staff to reveal the identity of persons involved in the discussions who had committed asocial or antisocial acts. Because of the shortness of the length of stay for most patients, the enculturation process and conscience development had to be hastened. In some instances this necessitated legal action toward an individual member for the welfare of the community, but for the most part, these matters were handled successfully within the group.

Passive, dependent attitudes of members toward their participation in the community came up frequently. These were treated as resistances to treatment and were verbalized in the meetings in such complaints as that the staff evaded answering their ques-

tions, that the group could not help individual members with their problems (that they required a doctor's aid), and that they had no problems.

The participation of the staff in the community still remains unsettled. Some of the staff felt insecure in the relaxation of former controls, and were only slowly able to transform to new roles in thich they could feel comfortable.

ACKNOWLEDGMENT: We are grateful to Captain Ira C. Nichols, MC, USN, for his advice; and to the nurses and hospital corpsmen who participated in this program, in particular to Commander Ellen Dolloff, NC, USN; Lieutenant Commander Mary Wolfgang, NC, USN; Lieutenant Marion Wardell, NC, USN; and Ben Geiger, Hospital Corpsman, second class, USN.

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Clinicopathologic Conference

U. S. Air Force Hospital, Sheppard Air Force Base, Tex.*

JAUNDICE IN INFANCY

Summary of Clinical History. A 6-month-old white male infant was transferred here from another hospital with a history of jaundice since birth which had persisted without significant change. The urine was described by the mother as frequently "darker than normal" but never dark orange or brown in color. The stools were said to have been intermittently "clay-colored." The patient had several episodes of vomiting and diarrhea since birth, the most severe of which occurred at the age of four months when he was admitted to another hospital. Rapid improvement occurred with treatment. The patient also had had a mild nonproductive cough for several months. Despite these symptoms he gained weight regularly. Several weeks before admission to this hospital it was noted that his abdomen had begun to distend.

Physical Examination. Examination revealed a well-nourished, well-developed white male infant with definite icterus of the skin and scleras. The heart and lungs were normal on examination. The abdomen was slightly enlarged, and the liver was palpated four fingersbreadth below the right costal margin. There was an equinovarus deformity of the right foot.

Laboratory Studies. Initial laboratory findings were as follows: erythrocyte count, 3,700,000/μl; hemoglobin, 10.0 grams/100 ml;

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leukocyte count, 4,400/μl, with 84 per cent lymphocytes, 12 per cent neutrophils, 3 per cent monocytes, and 1 per cent eosinophils. Bone marrow aspiration revealed 270 nucleated red blood cells per 100 white blood cells. The reticulocyte count was 2 per cent, and fragility studies were in the range of normal. Bilirubin was 7.7 mg/100 ml, with a prompt direct van den Bergh reaction. The icteric index was 40 units. Prothrombin time was 13 seconds (control, 16 seconds); and cephalin-cholesterol flocculation, 2 plus in 48 hours. Urobilin could not be demonstrated in the stool. The alkaline phosphatase was 7.8 Bodansky units. The serologic test for syphilis was negative.

Course in Hospital. The patient showed little change for two weeks, during which the presence of acholic stools was confirmed on two occasions. He then developed frequent paroxysms of coughing which became relatively severe and were occasionally followed by vomiting. The pharynx was moderately injected and filled with rather thick mucus. Coarse rhonchi were heard throughout the chest. Additional laboratory studies revealed a leukocyte count of 18,000/μl with 87 per cent lymphocytes, 6 per cent of which were reported as atypical. A culture from the throat grew *Micrococcus pyogenes* var. *albus*. Roentgenograms of the chest were read as negative. The patient was treated with various antibiotics with gradual disappearance of the cough and vomiting over a three-week period. At this time a laparotomy was performed.

DISCUSSION

Doctor Sullivan:* This is the case of a 6-month-old white male infant transferred here with a history of jaundice since birth. The urine was described as frequently "darker than normal" but never "a dark brown." The stools were said to have been intermittently "clay-colored." The patient had several episodes of vomiting since birth, the most severe of which responded to symptomatic treatment. There was a mild and nonproductive cough for several months. In spite of these symptoms the patient gained weight steadily. Several weeks prior to his admission it was noted that his abdomen had begun to distend.

Examination revealed a well-developed, well-nourished white male infant with definite icterus of the skin and scleras. Examination of the heart and lungs was within normal limits. The abdomen was slightly enlarged, and the liver was palpable four fingersbreadth below the costal margin. In an average baby the liver will be one or one and a half fingersbreadth below the costal margin. A liver four fingersbreadth below the costal margin will be down near the umbilicus. The foot deformity is not significant.

The red blood cell count was 3,700,000/μl with a hemoglobin of 10 grams/100 ml, which concerns many who do not deal with children.

*Capt. Harley C. Sullivan, USAF (MC), then Chief, Pediatric Section.

The average baby at six months of age will have a hemoglobin of around 11.2 grams/100 ml. The hemoglobin and red blood cell count in this patient do not necessarily indicate anemia, particularly as these findings are not too accurate in any laboratory and because a lot of children live on milk only. The profound anemias of childhood will be much more severe than this. In truly anemic children of six months of age a hemoglobin of 6 or 7 grams/100 ml is not uncommon.

The reticulocyte count was 2 per cent. As a normal count for this age group is about 1 per cent, this could easily be within normal limits. It does not mean much if no more than that. The fragility studies were within normal limits. The icteric index was 40 units, which corroborates the reported elevated serum bilirubin. The alkaline phosphatase was 7.8 Bodansky units, a finding within normal limits.

The child had a benign course without change for two weeks, during which time the presence of acholic stools was confirmed on only two occasions. In our ward we have the nurse save the stools and we examine them ourselves. A lot of times this is much more reliable than ordering urobilinogen tests, et cetera, from the laboratory. Other examinations of the stools are not reported, but only twice did the the infant have really clay-colored stools, and this may be truly significant. He then began to have paroxysms of coughing. The larynx was moderately injected and filled with mucus. Coarse rhonchi were heard throughout the chest. The previous respiratory infections described were not particularly abnormal in frequency. The blood cell count at this time was peculiar in that there was a leukocyte count of 18,000/μl with a marked preponderance of lymphocytes. The infant had a pharyngitis and a bronchitis and responded to antibiotics over a three-week period. Then a laparotomy was performed.

There are, in children, problems more common but probably none more interesting than that of jaundice. In my pediatric practice, next to upper respiratory infections, I have probably seen more cases of jaundice than of anything else. The case that I usually see is that of a child two and a half to four weeks old with a physiologic jaundice a little more extreme and a little slower to clear than we are accustomed to seeing. Physiologic jaundice usually starts about the third or fourth day, and the process is most extreme by the sixth to ninth day. It usually clears by the 14th day, but this is not always true as I have seen it last for a little bit longer. Serum bilirubin findings during the height of physiologic jaundice have been reported as high as 20 mg/100 ml, which is greatly elevated.

The next most common entity that we see is erythroblastosis fetalis, but this is an acute illness that occurs in the first few days of life. Inspissation of bile with obstructive phenomena and liver cell damage can occur, but does not fit this case because the patient had no history of difficulties in the neonatal period. Sepsis can produce jaundice, but is associated with the critically ill. In the absence of good therapy such children do not live long—certainly not six months.

Congenital syphilis produces profound anemia in acutely ill children, multiple areas of periostitis, and all the other stigmata of congenital syphilis that have not been described in this child.

There are certain infections that involve the liver in the newborn period and infancy that might fit the picture we have described here. In the past two years there have been numerous reports of homologous serum jaundice being transmitted from the mother to the child. It is surmised that this is one of the causes of congenital abnormalities of the extrabiliary and intrabiliary duct system.

The viruses that cause herpes simplex in adults and herpes stomatitis in children may also produce transplacental infections. The patients reported have had a rapid, fulminating hepatitis which shortly terminated in death. To my knowledge, cases with a long course simulating an obstructive jaundice have not been reported.

Another disease in infants that we have become acquainted with in the last few years is infectious mononucleosis, presenting only jaundice, hepatomegaly, and splenomegaly. This picture could well fit this child. The only really remarkable abnormality in the blood cell count is the marked preponderance of lymphocytes which, again, we see occasionally in infection in children. A heterophile antibody test was not reported in this case. The congenital biliary obstructions are the diseases most likely to be found in this age group. At times they are quite confusing. These children grow and do well, but they have steatorrhea with increasing jaundice, and their stools are clay-colored more or less constantly. This child was here some six weeks, and the stools were noted to be clay-colored on only two occasions. Probably a diagnosis of absence or complete atresia of the hepatic ducts with complete obstruction is not justified. The picture is perfectly compatible with congenitally small bile ducts with intermittent or insufficient biliary drainage. The inspissation of bile causing temporary plugging has been discussed at great length, and there have been a few such cases reported. I have had the privilege of seeing and following one such case.

Fibrocystic disease can occasionally involve the liver, primarily in association with repeated upper respiratory infections. If this were true in this case, you would certainly anticipate steatorrhea, more diarrhea than is described, and a malnourished child who is not doing well. It would be most unusual for fibrocystic disease to derange hepatic function to the degree present in this patient without more evidence of lung and pancreatic involvement.

For my diagnosis, then, I would list first some congenital abnormality causing temporary or intermittent obstruction of the bile ducts. Infectious mononucleosis is my second choice, and hepatitis due to homologous serum jaundice is my third.

Doctor Chamberlain:* I think that Doctor Sullivan has covered the differential diagnosis and clinical aspects of the various forms of jaundice in the newborn infant quite well. I think that we are forced to conclude that this is an obstructive type of jaundice simply because the clinical picture does not fit a hemolytic type of jaundice, and the hepatis, although possible, does not seem to be quite as likely as the obstructive type. By and large the majority of the obstructive types of jaundice in infancy are caused by atresias of the biliary tract, which can take multiple forms. If the intrahepatic passages and the upper portion of the hepatic ducts and the common bile duct are patent, the case is potentially curable by surgical means. It is not possible and certainly not practical to differentiate at all times the exact type of obstructive jaundice present. Once the diagnosis of obstructive jaundice is made, an exploratory laparotomy is obligatory to find exactly what is going on and whether or not the patient can be cured. If the passages in the liver and the upper portion of the common bile duct are patent, the common bile duct, or sometimes the gallbladder, can be anastomosed to the duodenum. If the atresia takes place within the liver, of course, it cannot be corrected surgically. In this event, the incision is closed after removal of a biospy specimen of the liver and exploration of the bile duct. By and large, a stricture high up in the hepatic ducts, even though extrahepatic, is difficult to treat surgically.

The other causes of obstructive jaundice in the newborn infant have been mentioned. Inspissated bile frequently seems to be associated with obstruction of a small bile duct, although we cannot actually call these atreasias. It is probable that if the bile ducts were not small the bile would not become inspissated.

Erythroblastosis fetalis is more frequently associated with inspissated bile than any other single disease, and the reason for this is the excess bile pigment and debris. I think that erythroblastosis with inspissated bile producing this degree of jaundice is unlikely here for reasons that have been mentioned—the patient should have had a profound anemia and a little different clinical course.

Large lymph nodes pressing on the bile duct can cause jaundice which is typically intermittent, and this could be due to any disease that causes lymphadenopathy. Any neoplasm in the neighborhood of the bile duct can cause obstructive jaundice, but in infancy such lesions are quite rare.

A cephalin-cholesterol flocculation of 2 plus and hepatomegaly are consistent with obstructive jaundice of six months' duration because there is usually a fair amount of secondary biliary cirrhosis in these patients. The evidence of intermittent jaundice, bilirubin of 7.7 mg/100 ml, and icteric index of 40 units are slightly

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*Capt. Gilbert L. Chamberlain, USAF (MC), then Assistant Chief, Surgical Service.

against biliary atresia because most patients with atresia lasting for six months have more intensive jaundice than this.

In this hospital the patient was noted to have acholic stools on two occasions. I do not know from the protocol whether this means that the stools were only examined two times or whether they were examined at other times and were not found to be acholic.

Doctor Jensen: There is nothing in the chart to indicate that there was ever bile in the stool.

Doctor Chamberlain: Apparently the jaundice did not vary in intensity, but sometimes that can be misleading. It is difficult for parents to be able to estimate the degree of jaundice, especially if the jaundice should increase slowly. I think the biggest point against an inspissated bile syndrome is that after six months the patient still had about the same amount of jaundice as he had at the beginning. I believe we all agree that laparotomy was indicated in this case.

For a diagnosis I would have to say that biliary atresia was my first choice and inspissated bile syndrome a close runner-up.

Doctor Warner:* Not very much has been said about the possibility that the jaundice was caused by a pigment calculus, for this child may have had hemolytic anemia. If that were the case, we have ample evidence that there was an obstructive jaundice even though it may have been intermittent. I do not see that the peculiar hematologic findings have been satisfactorily explained. There is, on one hand, the relative lymphocytosis, and on the other, evidence in the bone marrow of increased erythropoietic activity in association with a relatively normal reticulocyte count. The absence of a palpable spleen would be unusual with hemolytic anemia or with such prolonged obstructive jaundice. This patient had actually had obstructive jaundice for six months, and so I would expect that, whatever the cause, there would at least have been a slight degree of biliary cirrhosis. The protocol mentions a swelling of the abdomen for several weeks just prior to admission, and perhaps this was the beginning of ascites. At any rate, I think that the possibility of hemolytic anemia with a bile pigment stone has to be considered and that certainly, whatever the cause of the obstructive jaundice, early biliary cirrhosis was also present.

Doctor Jensen: We might mention one other possible diagnosis in this discussion; that is the so-called cyst of the choledochus. This patient, however, is a little young to have this lesion. The word cyst is a misnomer because these lesions are due to an enlargement of the common duct similar to megaloureter or possibly Hirschsprung's disease. Jaundice usually occurs later than in this patient. The discussion of this case, I think, depends to some extent on the accuracy of the history. Whether or not the jaundice actually fluctuated or

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the stools contained bile during this time is most important, but it is almost impossible to determine these events from the history as given. The history concerning the pregnancy and delivery was apparently noncontributory. Doctor Wilson, do you have any comment regarding the blood picture?

Doctor Wilson:* The values as reported are rather unusual. The child seemed to be anemic as the hemoglobin was 10 grams/100 ml and the red blood cell count 3,700,000/μl. The white blood cell count of 4,400/μl was certainly low for a child of his age, and 84 per cent lymphocytes was abnormal. The differential count in a child of this age usually includes about 60 per cent lymphocytes. The bone marrow aspiration was rather vaguely reported, it being stated that there were 270 nucleated red blood cells but it was not stated whether there was normal maturation of the red blood cells. We do not know whether these were primarily normoblasts, whether they were erythroblasts, or if any megaloblasts were present. A ratio of 270 nucleated red blood cells per 100 white blood cells is rather high unless there has been a depression of the white cell series. Usually there are around 400 white blood cells per 100 nucleated red blood cells. This finding and the anemia would definitely be consistent with marked hemolysis; however, a reticulocyte count of 2 per cent is not consistent. Fragility studies were in the range of normal; I assume that this was saline fragility. We have been given no description of the red blood cells in the peripheral blood. It certainly would appear that some hemolytic process was going on or that marked depression of the myeloid element of the bone marrow was present.

Dr. Sullivan's diagnosis:
Congenital abnormality of the bile ducts, or infectious mononucleosis, or hepatitis due to homologous serum jaundice

Dr. Chamberlain's diagnosis:
Biliary atresia or inspissated bile syndrome

Doctor Marsh:** At laparotomy this child was proved to have a complete obstruction of the hepatic duct just proximal to where the cystic duct joins the hepatic duct to form the common bile duct. The hepatic duct proximal to the obstruction was dilated approximately 3 cm and distended with bile. The gallbladder was present and appeared to be normal. A side-to-side anastomosis between the hepatic duct and the jejunum was done. Postoperatively the child did well for about four days, and bile reappeared in the stool. On the fourth postoperative day the child became lethargic and developed a fever up to 104°F. He became comatose and died on the following day.

*Capt. William L. Wilson, USAF (MC), then Chief, Medical Section.
**Capt. Robert L. Marsh, USAF (MC), then Chief, Laboratory Service.

PATHOLOGIC FINDINGS

The autopsy was restricted to the abdomen through the surgical incision. Examination of the liver, duodenum, and stomach showed that the anastomosis was functioning and that there was bile both in the stomach and in the duodenum. The grossly nodular, bile-stained liver weighed approximately 500 grams, and the cut sections showed dilatation of the biliary system within the liver and marked portal fibrosis.

Pathologic diagnoses:

1. Cirrhosis, secondary to congenital atresia of the common hepatic duct
2. Centrolobular bile stasis
3. Functioning choledochojejunostomy

PRIMARY MILIARY TUBERCULOSIS OF THE LIVER

"Primary miliary tuberculosis of the liver was found in 12 cases under conditions showing that it is not rare but is easily overlooked as a possible cause of obscure illness. The symptoms found in all these case histories included fever, lassitude, weakness, anorexia, weight loss, chills, and drenching sweats. Reaction to the Mantoux test was positive in all. No cases of jaundice were seen. Hepatomegaly, splenomegaly, ascites, alcololism, and exposure to tuberculosis are clues to the diagnosis. Needle biopsy of the liver is valuable but need not be done immediately in very weak patients, since recognizable tubercles remain in the liver for weeks after successful therapy has started. Isoniazid and aminosalicylic acid are now given to every patient, with streptomycin and steroids if necessary. The response in the cases here described was remarkably good, and sometimes dramatic. All of the eight patients whose treatment was considered adequate recovered without sequelae."

—R. BARRATT TERRY, M. D.,
ROLF M. GUNNAR, M. D.
in *Journal of the American Medical Association*
p. 150, May 11, 1957

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SERVICE ARTICLES

APPLICATION OF PSYCHODYNAMIC PRINCIPLES TO PSYCHOTHERAPY IN MILITARY SERVICE

HARRY TROSMAN, *Lieutenant, MC, USNR*
I. HYMAN WEILAND, *Lieutenant Commander, MC, USNR*

NOTWITHSTANDING the recent emphasis on pharmacologic agents, psychotherapy remains the most important and essential tool for the psychiatrist. All forms of psychotherapy during the past half century have been markedly influenced by psychoanalytic principles. Even when the orthodox psychoanalytic approach is not indicated, as in the military service, psychodynamic treatment technics can still play a vital role.

There are characteristics of the military services that prohibit a thoroughgoing psychoanalytic approach, and it is unnecessary for the psychiatrist to rigidly model his treatment technics on those of the psychoanalyst. The type of case under consideration, the intensity of the psychotherapeutic endeavor, the time available, and the degree of improvement considered adequate, necessitate a more flexible approach on the part of the psychiatrist and a greater utilization of those aspects of the military situation that can be helpful to the patient.

THE MILITARY SITUATION

Certain characteristics of the military situation actually may create difficulties for the psychiatrist, especially if he cannot consider them as social realities. It is necessary to recognize the reality of these characteristics and appreciate that adequate psychotherapy can be done within the limits they impose.

By its very nature, the totality of the military is somewhat inflexible, since the service must function as a highly integrated activity with purposes somewhat at variance with the alleviation of problems of neurotically vulnerable individuals. For this reason the adherence to regulations and a tightly knit, disciplinary organization, though at times frustrating for the psychoanalytically oriented psychotherapist, are realistically appropriate.

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Although psychotherapists have found that their work proceeds most effectively when the therapeutic relationship is colored by a permissive atmosphere, this is offset by the necessity for obedience that is present in the total military situation. Insofar as the psychiatrist must also function in an administrative capacity, the treatment he gives is often handicapped by this secondary role. On the one hand, with regard to those patients who have motivational problems regarding their adjustment to the service, he must make dispositional decisions regarding separation of patients from the service; on the other hand, he must treat patients who frequently distort his function as administrator or physician. Thus, the psychiatrist undergoes a certain confusion regarding which function is primary. Frequently, a poorly motivated patient will exploit the psychiatrist's double function in order to resist psychiatric treatment, and will orient himself primarily in terms of a discharge from the service.

Certain more selective aspects of military life may increase the psychiatrist's difficulty in treatment. His time is often limited, and he or his patients are subject to practical necessities of military life that may interfere with the duration of treatment or its regular performance. The psychiatrist or his patients frequently are transient, so that neither may have the secure knowledge that treatment can proceed over a prolonged period of time without interference.

These considerations often may affect the psychiatrist in an adverse manner when he considers the possibility of performing adequate psychotherapy. He may not consider the positive aspects of military life that serve as a stimulant toward improvement in the patient and can be utilized by the psychiatrist advantageously during the course of treatment.

ADVANTAGES OF THE MILITARY SERVICE FOR THE PSYCHOANALYTICALLY ORIENTED THERAPIST

Of great importance to the psychiatric patient is the opportunity afforded to participate in a markedly cohesive group. He frequently has an opportunity for identifying himself with values and activities that are concrete, well-formalized, and ego-supportive. The group is conducive to dependency gratification and is characterized by a mutual appreciation for common problems. For the patient who has difficulty in the area of ego control, the group provides a clear-cut understanding of what is positively and negatively sanctioned. It frequently is observed that the group can tolerate a psychologic disturbance in one of its members in a most understanding manner. There is little social stigmatization with such a disability, and there is a sympathetic awareness that men may react with neurotic symptomatology under stress. The group provides an opportunity for the temporary

alleviation of many of the stresses associated with individual responsibility.

During the course of psychotherapy, it often is necessary for the patient to re-experience feelings and emotions that were characteristic of his relationships with his parents in early childhood. The re-establishment of these parental relationships is often facilitated simply by the hierarchical structure of the military situation. It is more possible for the patient to transfer some of these childhood emotions toward figures who, because of their rank, have already attained for him a role of father or brother surrogate.

Generally, the psychiatrist prefers to interfere as little as possible with the realities in a patient's life. Occasionally, however, one does meet the patient for whom it is desirable to effect some environmental manipulation. The presence of organization, the readiness with which this organization lends itself to pliability, and the assurance of proper liaison between line and medical officers, can be utilized therapeutically. For the patient who has difficulty in controlling acting-out and aggressive outbursts, the presence of well-defined limits as to what is appropriate and will be tolerated serves as a stimulant to the development of internal control, so that in time he can mature sufficiently to decide for himself when an antisocial and unacceptable impulse must be regulated.

A constant hazard in civilian psychotherapy is the danger that the patient will relate to the psychiatrist in a destructive, dependent, nontherapeutic, clinging relationship. In the military service, the emphasis on rapid improvement and the lack of opportunity for time-consuming therapeutic relationships often obviate the development of this difficulty. Every civilian psychotherapist has had experience at some time in his career with difficulties in treatment when relatives have frequent access to the psychotherapist and influence the patient in some manner that will increase his resistance to continuing the treatment. Frequently the geographic distance from home and the sharp differentiation between civilian and military life free the patient and the psychiatrist from this additional burden.

PSYCHODYNAMIC PRINCIPLES

By and large, orthodox psychoanalytic treatment technics cannot be utilized in the service. These technics are time-consuming, expensive, and frequently not indicated in terms of the patient's disability. Psychoanalysis is a model procedure that represents an end point along a continuum on which similar, but attenuated, technics can be utilized. In the military service it is possible to use these attenuated technics in such a manner as to derive the most benefit in achieving psychotherapeutic aims.

In a therapeutic setting, it has proved to be most helpful to divorce the administrative and the therapeutic functions of the psychiatrist. The patient is handled administratively by his ward medical officer, and treatment is carried out in regular interview sessions with the psychiatrist, who is not involved in such matters as granting liberty, deciding on a final disposition of the patient, and instituting disciplinary action when indicated. The following case will serve as an illustration.

Case 1. A 22-year-old sergeant with 3 years of active duty was admitted to the hospital because of an anxiety reaction that had been present for about a year. At the time of admission the patient was convinced that his symptoms were the result of stresses to which he had been exposed while on active duty. His initial motivation was to be separated from the service. Following his admission work-up, he was assigned to a psychiatrist who was not his ward medical officer and was told that this psychiatrist would treat him but would take no responsibility for the final disposition regarding his returning to duty or separation from the service. Initially, the patient attempted to manipulate the psychiatrist into a more active role and tried to resist treatment by bringing up dispositional matters. The patient was advised to discuss these with his ward medical officer. When the patient began to face his problems, his symptoms improved. At the end of a three-month period of hospitalization and treatment, he was interviewed by his ward medical officer, who recommended that he be returned to full duty.

In the service, the need for establishment of group identification and a sense of identity can be facilitated by manipulating external situations and thus exploiting to best advantage the patient's capabilities, as case 2 illustrates.

Case 2. A 19-year-old private, first class, with 1½ years' service, was admitted to the hospital complaining of masochistic sexual fantasies and depressive feelings of several years' duration. Prior to entry into the service, the patient had been active in high school activities, where he satisfied certain exhibitionistic tendencies and leadership needs by taking part in dramatics and athletics. After a short period of hospitalization, it was determined that he had difficulties in considering himself to be a part of the group. He could doubtless function in a better capacity and overcome his symptoms if his leadership capacities were more fully utilized. The liaison officer suggested transferring the patient to the military police. This was done and he "found himself" responding very well to his new assignment. His aggressive impulses were utilized in socially acceptable channels, and he no longer had to turn them into reflexive masochistic fantasies.

It has been desirable, after a sufficient period of psychotherapy and hospitalization, to recommend that the patient be returned to limited duty status, treatment being continued during the period of limited duty. This avenue of approach can be utilized for those

patients who require a period of "weaning" toward the end of treatment, rather than abrupt termination. Case 3 is an example.

Case 3. A 47-year-old lieutenant developed a neurotic depressive reaction following a divorce three years prior to admission to the hospital. Initially, the patient related himself to the therapist in a markedly dependent regressive manner. As he was encouraged in this dependent relationship, the patient overcame feelings of depression and a limited duty assignment was recommended. During the course of the patient's return to limited duty his progress was followed in weekly interviews, and he managed to attain a more independent and self-assertive status without again becoming depressed.

In psychodynamic therapy it frequently is possible to effect a major personality change in a patient without producing insight, if the relationship with the therapist is sufficiently corrective and emotionally meaningful. This can be done with the patient for whom the heightened authoritarian aspect of the doctor-patient relationship recapitulates his relationship with his father, so that the patient reacts to the therapist in a manner that closely resembles his early childhood reaction. In such a situation the therapist must then assume a role which reveals to the patient his neurotic reactions and their inappropriateness.

Case 4. A 27-year-old lieutenant (junior grade), with 2½ years' service, was admitted to the hospital with an acute anxiety reaction. Though a capable and efficient officer aboard his ship, the patient frequently felt the need of a strong, authoritarian figure upon whom he could depend. His admission was precipitated by the departure of a friend, several years older, whom the patient had frequently consulted for advice and support. During the initial phase of treatment, the patient utilized the difference in military rank to permit himself to relate to the therapist much like a helpless child. The therapist, however, made few comments to the patient, asked few questions, and gave no advice. The patient became increasingly disturbed by this behavior of the therapist, until it was pointed out to him that he had sufficient maturity not to need this kind of support. In time, the patient saw how this characteristic had determined so many past relationships and began to experiment at being more self-assertive and aggressive. These endeavors were encouraged by the therapist, and the patient soon overcame his more dependent, anxiety-provoking feelings.

SUMMARY

Psychotherapy as a treatment procedure is of great importance to the military psychiatrist. The military service provides several advantages for the psychoanalytically oriented psychiatrist that are of aid to him in doing efficient and useful psychotherapy. It is the application of modified, flexible, psychodynamic technics in the realistic, social setting of the military service that produces significant results in treatment.

DENTAL INCIDENT RATE IN PARACHUTING

ROBERT F. WEBER, *Lieutenant Colonel, DC, USAR*
ROBERT P. MOSS, *Major, DC, USA*

DOES parachuting cause a proportionately greater number of dental accidents than any other type of military or non-military activity? Should a man who wears a removable prosthetic appliance, either full or partial, remove it from his mouth while engaging in parachute activities, or retain it in place? Over the past 15 years, these two questions have arisen in connection with parachute activities and dental needs. To our knowledge, no specific studies of these questions have been made and no definite conclusions have been reached. All reports up to this time have been based on isolated experiences and pure speculation.

PROCEDURE

A record sheet was prepared (fig. 1) and distributed to the three dental clinics servicing airborne troops at this station. Examining personnel were instructed in its use and requested to complete a form for each patient who reported to the clinic with a complaint of dental injury or denture loss sustained during airborne training or actual parachuting. Any peculiar or unusual circumstances related to the event were to be described. The survey was carried on for a period of 18 months in order to obtain adequate coverage and significant data.

RESULTS

During the survey period, 178,672 parachute jumps were performed and 10,069 airborne trainees were graduated from the basic airborne course. In these months not one case of "high-altitude pain" was reported, but the injuries and dental losses shown in table 1 occurred while performing parachute jumps. During basic airborne ground training there were two instances of partial dentures being broken.

COMPARISON

A total of 48 fractures (either maxillary or mandibular) were treated at this station during the period covered. Only one of

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In an effort to determine the frequency, extent and type of dental accidents, arising from airborne activities, your cooperation is requested in filling out the following on all airborne personnel presenting themselves for dental treatment following such accidents or injuries.

1. NAME: 2. ASN:

3. ORG:

4. AGE:

5. JUMPS COMPLETED AT TIME OF ACCIDENT:

CHECK AS APPLICABLE

Type of accident or injury	Training (All airborne activities not including aerial flight)	Actual Jumping (All activities including loading, jumping, and landing)
Lost denture:		
Full	( )	( )
Partial	( )	( )
Broken denture:		
Full	( )	( )
Partial	( )	( )
Fractured natural teeth: (List number of teeth involved including sheared cusps)		
Fractures:		
1) Mandible		
Body	( )	( )
Ramus	( )	( )
Condyle	( )	( )
2) Maxilla	( )	( )
3) Zygoma	( )	( )
Soft tissue injury:		
Misc: Give details		

Figure 1.

these was a direct result of parachuting. The remainder were caused by blows, falls, automobile accidents, et cetera, all having no relation to parachute activities.

During this same period 1,415 broken dentures were repaired at this station. Only five of these were broken as a result of parachuting or ground training for parachuting.

No comparison figures are available for the total number of lost dentures, fractured natural teeth, or soft tissue injuries from all causes during the survey period, but we believe that,

in these items also, parachuting contributed only a minor percentage of the total.

TABLE 1. *Injuries and dental losses incident to 178,672 parachute jumps*

Accident		Previous jumps performed
Type	Number	
Denture		
Lost	8 (4 full, 4 partial)	17, 12, 6, 20, 17, 5, 31, 12
Broken	3 (2 full, 1 partial)	90, 8, 20
Natural tooth broken	3	6, 6, 6
Mandible fractured	1	12
Soft tissue injury	3*	117, 13, 2

*1 due to biting tongue; 2 due to equipment webbing, which forced soft tissue against teeth.

CONCLUSIONS

Aerodontia is not a primary factor in dental service for airborne personnel.

The rate and extent of dental injuries and oral embarrassment due to parachute duty is extremely slight and of no particular significance in relation to the nature of the hazardous duty performed, and there does not appear to be any correlation between an individual's experience (number of jumps previously completed) and his susceptibility to a dental accident. The fact that all three of the cases of fractured natural teeth occurred after the sixth jump of the individuals concerned is probably coincidental.

The dental accident rate was approximately 0.01 percent of the completed jumps. Inasmuch as about 8 percent of the airborne troops at this station have some type of prosthetic appliance, it is recommended that these appliances be retained in place, if only to aid in supporting the soft and hard dental structures.

Based on this study, no special consideration appears to be warranted from the dental standpoint for personnel on airborne status other than routine dental care.

CASE REPORTS

Decompression Sickness at Medium Altitude

STUART A. SCHNECK, *Captain, USAF (MC)*

WHILE all flight surgeons are familiar with decompression sickness or dysbarism, many military physicians in other specialties or in general medicine are unaware of the symptoms and signs of this condition. Moreover, few of these physicians realize the inherent seriousness of a pathologic situation in which the patient initially may present rather mild symptoms followed by collapse or death.[1,2] This report concerns the occurrence of a moderately severe case of dysbarism with central nervous system involvement first attended by a physician who was not a flight surgeon. This situation could occur to any medical officer, particularly at an Air Force base, and demands more than casual handling.[3]

CASE REPORT

The patient, aged 30, a test pilot for a maintenance squadron at a flying training Air Force base, with over 900 hours of jet aircraft flying time, had no previous history of any manifestations of dysbarism. The night before the flight to be described he had four drinks of bourbon whisky, the last one approximately 13 hours prior to the development of his symptoms. He had 5½ hours of sleep, and an adequate breakfast before the flight. No symptoms of fatigue or physical stress were noted prior to flying.

On 25 November 1956 the patient departed Portland Municipal Airport, Portland, Oreg., at 1330 hours in a T-33 aircraft with destination Lowry Air Force Base, Colo. He occupied the rear seat inasmuch as he was receiving an instrument check from another pilot in the front seat. There was no period of preoxygenation. On takeoff and up to 5,000 feet 100 per cent oxygen was breathed, and at 5,000 feet the regulator was switched to the "normal" oxygen setting. (This setting gives a mixture of oxygen and ambient air in which the per cent of oxygen increases as one ascends up to an altitude of 34,000 feet, at which time 100 per cent oxygen is being breathed.) About 45 minutes after takeoff, the aircraft reached cruise altitude of 40,000 feet, with a cabin altitude of 24,400 feet and approximately 15 minutes later (1

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hour after takeoff), he noted difficulty in focusing his eyes on the instrument panel. He immediately turned his oxygen regulator to 100 per cent oxygen, held his mask tighter against his face and asked the pilot in the front seat to check the cabin altimeter. The pilot stated it was still 24,400 feet.

After approximately 5 minutes on 100 per cent oxygen with no noticeable improvement in his vision, the patient turned his oxygen regulator to the pressure setting 43M. (This setting is used at cabin altitudes between 41,000 and 43,000 feet and delivers oxygen under a pressure equal to 8 inches of water.) Shortly afterward, his vision did improve slightly but was not perfect. He noted difficulty in reading the full aircraft serial number, which is a series of six numbers located on the instrument panel. At first he could read only one number at a time and could not even see the others. After about 15 minutes on pressure oxygen his vision improved to the extent that he could see four numbers at once. He checked this with his left and right eyes separately and then together and found that his vision was still the same.

Approximately 15 minutes after his initial symptoms, the patient very suddenly experienced a sharp pain in his left knee. Soon afterward he noted a slight pain in his right knee and spots on both thighs that "half itched and half hurt." Ten minutes later he noted the rapid development of a very severe headache over his entire head but primarily located behind his left eye. At this time he went back to 100 per cent oxygen without pressure because of the discomfort of pressure breathing and the fact that there was no improvement in his condition. During the course of 35 minutes of pressure breathing, his throat had become very dry and a slight cough had developed.

Descent was begun approximately 1 hour after the original visual symptoms appeared, and after passing through 20,000 feet actual altitude his knee pains and itching disappeared. The patient estimates the total time at 40,000 feet actual altitude (24,400 feet cabin altitude) was 75 to 80 minutes and that he was above 30,000 feet for an additional 20 minutes.

After landing, the patient reported: "After departing the aircraft [1½ hours after the onset of the symptoms], I noticed that I did not have complete control of my muscles. They were slightly jerky and twitchy. I could not walk straight and was slightly dizzy. My vision was somewhat blurred. I could not speak words clearly and my voice tended to high pitch. My thinking did not seem clear and I had some difficulty in understanding words. [He later added that the other pilot frequently had to repeat statements before he could understand them.] I sat down in Base Operations for approximately 20 minutes. The only symptoms that had disappeared were the knee pains, the itching, and the cough. All others were gradually getting worse. The headache grew to an almost unbearable state. I requested transportation to the hos-

pital and arrived there approximately 40 minutes after landing. I was in a deep state of depression and had a tremendous urge to cry but had no logical reason to do so."

The medical officer who first saw this patient was an orthopedic surgeon whose first impression was that he was dealing with a sinus headache or migraine. The insistence of the patient that he wanted to see the flight surgeon because he knew this was not a sinus headache made the medical officer consider dysbarism, despite the fact that this was a syndrome with which he was not too familiar. He did remember a discussion of the treatment of this syndrome at a hospital staff meeting and placed the patient at rest on 8 liters of oxygen per minute for 15 minutes. A flight surgeon was called and he examined the patient at 1900 hours. An hour later a second flight surgeon examined the patient.

His blood pressure was 110/70 mm Hg; pulse, 70 per minute and regular; temperature, 97.4°F; respiration, 16 per min; weight, 140 pounds; and height, 5 feet 5 inches. The fundi were normal. There was no nystagmus; pupillary reflexes and extraocular movements were normal. A gross confrontation test revealed intact visual fields and the patient's vision subjectively was no longer blurred. The neurologic examination revealed only slight weakness of the right hand. The Romberg test was negative. General physical examination findings were normal. The patient stated that he still did not feel quite right and still had a sensation of staggering when walking. He was definitely unsteady when his walking was observed.

The patient had received a total of 8 Cafergot (brand of ergotamine with caffeine) tablets in a 1-hour period before the first flight surgeon saw him. He had been nauseated before admission and at 2200 hours he vomited once. Definite improvement was then noted in his symptoms. The headache began to subside about 4 hours after admission. He was given 100 mg of Nembutal (brand of pentobarbital sodium) and slept fitfully during the night. Vital signs remained normal.

In the morning the patient had only a slight headache and a subjective feeling of general weakness. Weakness of the right hand was no longer apparent and no staggering on walking was noted or felt. Vision was 20/20 bilaterally for near and distant and depth perception; accommodation, phorias, and point of convergence were all normal. Recheck of his fundi was negative. Pupillary reflexes, tangent screen, and perimetry were normal, as were the general physical and neurologic examination findings. Test for carbon monoxide drawn on admission was negative. Laboratory studies performed the night of admission revealed a negative urinalysis. The hemoglobin was 15.7 grams per 100 ml. The white blood cell count was 8,400 per μl with 56 per cent neutrophils, 40 per cent lymphocytes, 1 per cent eosinophils, and 5 per cent basophils. The hematocrit was 43 per 100 ml and the sedimentation

rate was 5 mm per hour. A roentgenogram of the chest was normal. The patient stated that a vague headache and a feeling of grogginess persisted all day.

On 27 November the patient's headache was gone and he felt fine. Electroencephalographic findings were reported as normal. A neurologic examination revealed no abnormalities. On 28 November the patient again felt fine and he was released to full flying duty. He has since flown in the same aircraft to altitudes of 40,000 feet without any difficulties.

Final diagnosis was decompression sickness manifested by central nervous system involvement, "bends," and paresthesias.

COMMENT

There are many reports in the literature of cases of dysbarism occurring above 30,000 feet.[1,2,4,5] The lowest previously recorded case of decompression sickness with central nervous system involvement occurred in 1954.[6] The individual concerned had been at 26,000 feet cabin altitude for 1 hour and 40 minutes and then the aircraft climbed in about 4 minutes to a cabin altitude of 29,000 feet. He collapsed and died 5 hours and 25 minutes after the onset of symptoms.

Downey in discussing this case mentioned another occurring at a cabin altitude of 26,000 feet,[6] and in a personal communication referred to an unreported case occurring at 29,000 feet in 1953. Sproull[7] reported a fatal case of decompression sickness in the Royal Air Force which occurred 19 hours after a 1-hour flight between 28,000 and 30,000 feet.

While decompression sickness with central nervous system involvement is unusual below 30,000 feet, bends, which is another manifestation of decompression sickness, has been known for a long time to occur below this altitude. There is a recent report of bends affecting an officer in a B-52 aircraft at a cabin altitude of only 23,000 feet.[8] Strenuous exercise can induce bends at altitudes as low as 22,000 feet.[9] It appears, however, that this may be the first case of dysbarism with central nervous system involvement reported to have occurred below 26,000 feet.

To verify the reported cabin altitude of 24,400 feet, the pilot in the front seat, who was totally free of symptoms during the flight, was questioned. He reported that he checked the cabin altimeter several times during the flight and was positive that it never exceeded 25,000 feet. The cabin altimeter was placed in a vacuum chamber and checked with a mercury barometer. At 10,000 feet the altimeter was 100 feet in error and there was no other error in the instrument between sea level and 45,000 feet.

The aircraft concerned was flown at 40,000 feet actual altitude for 30 minutes and at no time did the cabin altimeter exceed 25,000 feet. The lowest cabin altitude noted at 40,000 feet was 24,500 feet. The aircraft's oxygen and pressurization systems were checked and no discrepancies were found. The patient's mask and connections were checked by the physiological training unit at the time of his admission to the hospital and nothing amiss was found. The aircraft had 450 p. s. i. (pounds per square inch) of oxygen on takeoff and on landing 225 p. s. i. remained. The patient, who is unusually familiar with his own hypoxia symptoms, checked his mask, oxygen pressure, and blinker many times during the flight, and throughout most of the flight held his mask firmly to his face. He did this despite the fact that he always wears a very tight-fitting mask.

From these checks and from the progressive pattern of the patient's symptoms after he was on the ground, it seems certain that hypoxia is ruled out. The headache, dysarthria, staggering, weakness of the right hand, visual impairment, and difficulty in comprehension are certainly suggestive of multiple intracranial lesions, presumably gas bubbles, fat emboli, or vasospasm. While no lumbar puncture was done, there were no signs indicative of meningeal irritation or papilledema to warrant consideration of intracranial hemorrhage. The onset, course, and recovery pattern are all consistent with the diagnosis of dysbarism.

SUMMARY

The need for a knowledge of decompression sickness on the part of military physicians has been emphasized. A case of dysbarism occurring at a cabin altitude of 24,400 feet has been presented. This is believed to be the lowest reported altitude for such an occurrence.

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A MESSAGE FROM THE A. M. A.

The Message last month dealt with the revision of the Principles of Medical Ethics acted upon at the 106th Annual Meeting of the American Medical Association in New York City in June 1957. Among the wide variety of other subjects acted upon by the House of Delegates were the Federal Government's Medicare Program, new standards for medical schools, a new statement on occupational health programs, and the issue of Social Security benefits for physicians.

The House considered three resolutions dealing with the Federal Government's Medicare Program for the dependents of servicemen. The delegates adopted one resolution condemning any payments under the Medicare Program "to or on behalf of any resident, fellow, intern or other house officer in similar status who is participating in a training program." Government sanction of such payments, the House declared, would give impetus to the improper corporate practice of medicine by hospitals or other nonmedical bodies. Such proposals, the House added, would violate traditional patterns of American medical practices, seriously aggravate problems of hospital-physician relationships, encourage charges by hospitals for residents' services to patients not under the Medicare Program, and create a variety of additional problems in such areas as medical licensure and health insurance.

In another action on Medicare, the House recommended that the decision on the type of contract and whether or not a fee schedule will be included in future contract negotiations should be left to individual state determination. In this connection, however, the House restated the A. M. A. contention that: The Dependents' Medical Care Act as enacted by Congress does not require fixed fee schedules; the establishment of such schedules would be more expensive than permitting physicians to charge their normal fees, and fixed fee schedules would ultimately disrupt the economics of medical practice. The House also suggested that the A. M. A. attempt to have existing Medicare regulations amended to incorporate the Association's policy that the practice of anesthesiology, pathology, radiology, and physical medicine constitute the practice of medicine, and that for services by physicians in these specialties should be paid to the physicians rendering the services.

From the Council on National Defense of the American Medical Association. The views and opinions expressed are not necessarily those of the Department of Defense.—*Editor*

To replace the "Essentials of an Acceptable Medical School," initially approved by the House of Delegates in 1910 and most recently revised in 1951, the House adopted a new statement entitled, "Function and Structure of a Modern Medical School." Presentation of the document followed a year of careful study by the Council on Medical Education and Hospitals in collaboration with the Association of American Medical Colleges.

The statement is intended to provide flexible guards which will "assist in attaining medical education of even higher standards" and "serve as general, but not specific, criteria in the medical school accreditation program." The document encourages soundly conceived experimentation in medical education, and it discourages excessive concern with standardization.

"No rigid curriculum can be prescribed for accomplishing the objectives of medical education," it states. "On the contrary, it is the responsibility of the faculty of each school continually to re-evaluate its curriculum and to provide, in accordance with its own particular setting and in recognition of advances in science, a sound and well integrated educational program."

The House also approved a new statement on the "Scope, Objectives, and Functions of Occupational Health Programs," submitted to the Board of Trustees by the Council on Industrial Health. The Board report to the House said: "The statement describes and defines orthodox implant medical programs as understood in this country today and distinguishes clearly between such programs and the various plans for comprehensive medical care of the sick. It should help to resolve misunderstandings concerning the specialties of occupational medicine."

In adopting the statement, the House agreed with a Reference Committee report which declared that "The House has reported a statement which, for the first time, clearly defines the scope, objectives, and functions of occupational health programs. It marks the needs and boundaries of occupational health programs in the practice of medicine and it clearly charts the pathways of communication between physicians in occupational health programs and physicians in the private practice of medicine."

Two resolutions favoring compulsory inclusion of physicians in the Federal Social Security System and another one calling for a nationwide referendum of A. M. A. members on the issue were rejected by the House. The delegates reaffirmed their opposition to compulsory coverage of physicians under the Old Age and Survivors Insurance provisions of the Social Security Act. They also recommended a strongly stepped up informational program of education which will reach every member of the Association, explaining the reasons underlying the position of the House of Delegates on this issue.

The House, at the same time, reaffirmed its support of the Jenkins-Keogh bill. These bills, which are now pending before the House Ways and Means Committee, would, if enacted, permit self-employed persons, including physicians, to defer tax payments on amounts used to purchase private retirement annuities.

DEATHS

ELY, Donald, Lieutenant, MC, USNR, of Spring House, Pa.; stationed at the U. S. Naval Retraining Command, Portsmouth, N. H.; graduated in 1954 from the University of Pennsylvania School of Medicine, Philadelphia, Pa.; appointed a Lieutenant in the United States Naval Reserve 12 October 1956; ordered to active duty 4 October 1956; died 24 June 1957, age 28, at Exeter Hospital, Exeter, N. H., of believed acute pancreatitis.

LARRABEE, Wayne Fox, Captain, DC, USA, of Norfolk, Nebr.; stationed at the Dental Detachment, U. S. Army Garrison, Fort Bragg, N. C.; graduated in 1952 from the University of Nebraska College of Dentistry, Lincoln, Nebr.; entered enlisted service in the Army of the United States 28 January 1943; commissioned First Lieutenant in the Medical Administrative Service 19 September 1943, while on active duty; commissioned a First Lieutenant in the Dental Corps of the U. S. Army Reserve and ordered to active duty 16 November 1953; commissioned a First Lieutenant in the Regular Army 7 March 1955; died 19 May 1957, age 34, near South Hill, Va., the result of an automobile accident.

ROTH, Barbara Ann, Second Lieutenant, ANC, USAR, of Cincinnati, Ohio; stationed at U. S. Army Hospital, Fort Ord, Calif.; graduated in 1955 from the Deaconess Hospital School of Nursing, Cincinnati, Ohio; appointed a Second Lieutenant in the United States Army Reserve 13 July 1956; ordered to active duty 10 August 1956; died 13 May 1957, age 22, at the U. S. Army Hospital, Fort Ord, of lymphatism and pneumonia.

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MILITARY MEDICO-DENTAL SYMPOSIUM

The First Annual Medical Department Symposium for Combined Armed Forces Medical Department Reserve Officers, under the auspices of the Commandant, Fifth Naval District, will be held at the U. S. Naval Hospital, Portsmouth, Va., 16-18 October 1957. "Advances in Operational Military Medicine" will be the theme of the three-day program.

The meeting on the first day will be conducted at the U. S. Naval Hospital, Portsmouth, with a special afternoon program at the U. S. Naval Dental Clinic, Naval Station, Norfolk, Va., for members of the Dental Corps. There will be separate meetings for members of the Nurse Corps and of the Medical Service Corps. On the second day, a meeting at the Fleet Training Center, U. S. Naval Base, Norfolk, will be highlighted by a talk on "Advances in Medical Defense Against Thermonuclear Injuries" by Rear Admiral Charles F. Behrens, MC, USN (Ret.). Lectures on the third day will be given at the U. S. Naval Hospital, Portsmouth.

Among the prominent guests and speakers on the opening day will be Major General James P. Cooney, Deputy Surgeon General of the Army; Rear Admiral Francis M. Hughes, Commandant, Fifth Naval District; Rear Admiral O. B. Morrison, Jr., District Medical Officer, Fifth Naval District; Captain Glenn W. Berry, DC, USN, District Dental Officer, Fifth Naval District; Captain Donald J. O'Brien, MC, USNR, Director, Naval Reserve Division, Bureau of Medicine and Surgery, Department of the Navy; Captain W. Leona Jackson, NC, USN, Director, Nursing Division, Bureau of Medicine and Surgery, Department of the Navy; Colonel Inez Haynes, ANC, Chief, Nursing Division, Office of the Surgeon General, Department of the Army; and Lieutenant Colonel Grace J. Hayden, USAF (NC), Command Nurse, Headquarters Continental Air Command, U. S. Air Force.

Retirement point credits will be awarded to those in attendance who are on the Active Status List in the Armed Services Reserve Program, provided they register with the authorized military representative assigned the duties of recording daily attendance.

Programs and additional information may be obtained by addressing the District Medical Officer, Fifth Naval District, Naval Station, Norfolk, Va.

DEWITT ARMY HOSPITAL
DEDICATED AT FORT BELVOIR

The second of nine new hospitals planned for the Army during the current building program was formally dedicated as DeWitt Army Hospital, named in honor of Brigadier General Wallace DeWitt, MC, USA, on 26 June 1957 at Fort Belvoir, Va. This new, multistory, 250-bed hospital, which can be expanded to 500 beds with the construction of two additional wings, cost approximately 4½ million dollars, excluding equipment, and epitomizes the latest thinking in the design and construction of hospitals. The structure is of a contemporary style of architecture, replacing a rambling series of World War II cantonment-type frame buildings. It is constructed along highly functional lines, and features centralized clinics, an audiovisual call system, a central dictation network, a 46-station pneumatic tube message carrier system, and other modern innovations. Colonel Charles L. Kirkpatrick, MC, USA, is the present commanding officer.

A short dedication ceremony was held in the main lobby where a portrait of the late General DeWitt and a dedicatory plaque were unveiled by General John DeWitt. The plaque reads as follows:

1957
DEWITT ARMY HOSPITAL
FORT BELVOIR, VIRGINIA
Named in Honor of
BRIGADIER GENERAL WALLACE DEWITT
MEDICAL CORPS, UNITED STATES ARMY
1878-1949

The main ceremony was held in a wooded area directly across from the new hospital. Major General Silas B. Hays, Surgeon General, United States Army, gave the dedication address. Speaking to a group of distinguished visitors which included members of the DeWitt family; Major General Dan C. Ogle, Surgeon General, United States Air Force; and Major General David H. Tulley, USA, Commanding General, U. S. Army Engineer Center and Fort Belvoir; General Hays paid great tribute to the officer in whose name the hospital was dedicated, saying:

We are here today to dedicate a hospital. I would be the last to say that the quality of medical service depends primarily on the quality of the physical plant in which it is housed. Primarily it depends on the professional competence and enthusiasm of the people comprising that service. On the other hand, I would not say that the physical plant has no effect on the quality of medical service. Here at Fort Belvoir you have had an excellent medical serv-

ice in spite of undesirable buildings. I have great confidence that you will have an even better medical service now that you have this wonderful new hospital on your post. I know both the patients and the staff will be happier and prouder.

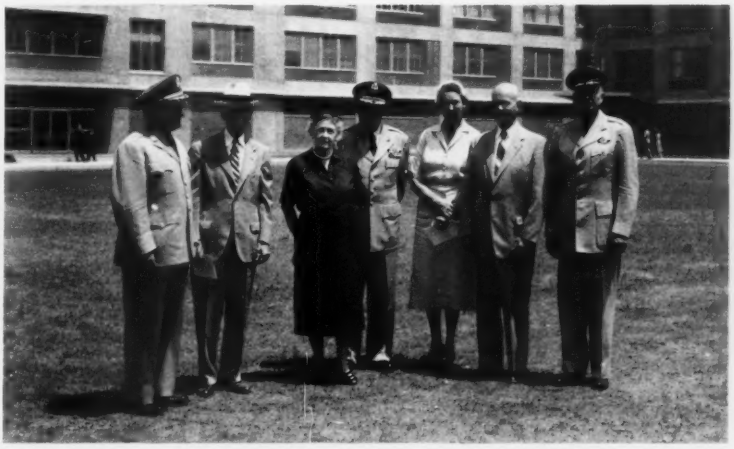
The newly dedicated DeWitt Army Hospital, Fort Belvoir.

DeWitt Army Hospital continues a new tradition in the Army Medical Service. Heretofore, we have had "named" hospitals and "post" or "station" hospitals. As our new permanent post hospitals are completed and put into operation, we plan to name each one. It is appropriate that this newest of our Army hospitals bears the name of one of the most outstanding medical officers in our Army's history, Brigadier General Wallace DeWitt. It is most proper, also, to note that this occasion marks the second time the Army and the Army Medical Service have saluted the name of DeWitt in this manner; in February 1944, when the Army activated a General Hospital at Auburn, Calif., it was named in honor of Brigadier General Calvin DeWitt, father of the outstanding medical officer we are here to honor today.

Throughout the history of our country, the United States Army has furnished many of our greatest public leaders. In like manner, the Army Medical Service has had the good fortune to list among its members medical men whose skills and abilities gained national recognition—to name only a few, Beaumont, Letterman, Gorgas, Sternberg, Walter Reed, Keller, Craig, Simmons, and Ireland. Included in any list of our illustrious Army medical men must be the medical officer in whose name we dedicate this hospital today, Brigadier General Wallace DeWitt.

It is not my intention here today to review General Wallace DeWitt's life, or to list his accomplishments and the honors that were accorded him. All of these are a matter of record, shining brightly on a special page of the Army Medical Service's history. I do believe it is fitting to note some of the highlights of General DeWitt's life in order that you may also come to appreciate his abilities and understand why we are naming this hospital for him.

General DeWitt was born in 1878 at Fort Steele, Wyo., the son of an Army officer. His father served the Army for 49 years as an infantry and later as a medical officer. General DeWitt received his M. D. degree from the University of Pennsylvania in 1900 and entered the Army the same year as a contract surgeon. His first assignment was in the Philippines and included action in several expeditions, as well as duty on the island of Corregidor.



Reading left to right: Major General David H. Tulley, USA, Commanding General, U. S. Army Engineer Center and Fort Belvoir; General John DeWitt, USA (Ret.); Mrs. Ruth Blanchard; Major General Silas B. Hays, Surgeon General, U. S. Army; Mrs. Calvin DeWitt; Brigadier General Calvin DeWitt, USA (Ret.); and Major General Dan C. Ogle, Surgeon General, U. S. Air Force.

In World War I he was Surgeon of the 83d Division, and then joined the VIIth Corps as Chief Surgeon, serving in the St. Die section in the First Army Sector, and participating in the Meuse-Argonne Offensive.

Returning from France in 1919 he was assigned to Fort Thomas, Ky., and Fort Sam Houston, Tex., after which he was assigned to Letterman General Hospital in San Francisco. He became professor of military hygiene and post surgeon at the United States Military Academy at West Point in 1931, remaining at that post until named head of the Walter Reed Army Medical Center in 1935. In December of that year he was appointed Brigadier General, Assistant to The Surgeon General, a post he held until 1939.

He again assumed command of Letterman General Hospital in 1940. Retired for age in 1942, he was immediately recalled to active duty because of our entry into World War II. He became port surgeon, San Francisco Port of Embarkation, and served with his usual distinction in that assignment until ill health caused him to retire in 1945.

Failing strength severely limited his activities following retirement, and the loss of his beloved wife in the year of his retirement affected him most deeply. General DeWitt died in December 1949 at Letterman Army Hospital, where he had passed many happy and successful years, and he was buried in Arlington.

General DeWitt was a man who loved and who followed the highest precepts of the doctor and the soldier; service to his country, the healing of human ills, the instruction of youth. His devotion to his chosen profession of healing and his dedication to duty were the hallmarks of his noteworthy service to the Army, the medical profession, his country and his fellowman.

Standing before portrait of the late Brigadier General Wallace DeWitt, MC, USA, are (left to right) Major General David H. Tulley, Major General Silas B. Hays, and General John DeWitt (retired).

We are pleased to have with us today General DeWitt's brother, General John L. DeWitt (retired); his brother, Brigadier General Calvin DeWitt (retired); and his sister, Mrs. Robert M. Blanchard, widow of an Army officer. It is not often that we have an entire family whose life has been and is so closely related to the Army. I know that all of them treasure this moment and that the memory of this occasion will be cherished with the many other memories they have of their distinguished brother, and his contributions to the nation as an Army medical officer. I know all of us are glad that so many members of this great DeWitt clan are able to be with us today and join us in honoring one of the greatest members of their illustrious family. I know all of you join with me in the wish that this occasion will provide one more proud and happy memory for all of them.

General DeWitt received countless commendations for his professional skill and administrative ability during his long career. His reputation is already secure; yet I believe this fine new building will make certain that his unquestioned brillance is properly memorialized in our time.

Both the Army Medical Service and Fort Belvoir have reason to be proud to dedicate this hospital today to a man who gave of himself to the Army as completely and as selflessly as did General Wallace DeWitt.

Legion of Merit to Three Air Force Officers

The Air Force recently awarded the Legion of Merit to Major General William H. Powell, Jr., and Colonels Manah R. Halbouty and Robert A. Patterson, USAF (MC) for exceptionally meritorious conduct in the performance of outstanding service.

General Powell, former deputy surgeon general of the Air Force and now senior medical officer at SHAPE, was cited for his "significant efforts, as a military leader and physician . . . in raising the United States Air Force Medical Service to an unprecedented level of professional competence . . . with its resultant contribution to the operational capability of the Air Force."

Colonel Halbouty's "outstanding professional and administrative skill . . . were instrumental in making noteworthy contributions to the Air Force Medical Service mission," while he was wing surgeon and hospital commander at Ellington Air Force Base, Tex. He is now commander of the U. S. Air Force Hospital, Itazuke Air Base, Japan.

Colonel Patterson was commander of the U. S. Air Force Hospital, Madrid, Spain, from 24 August 1954 to 27 December 1956 where he "demonstrated outstanding initiative and creative imagination in locating, equipping and maintaining a compact, modern medical facility able to provide excellent medical care for military personnel in Spain . . . and by his professional competence, tact, and extensive knowledge of medical problems . . . gained the assistance and cooperation of the local medical authorities." He has been reassigned to Stewart Air Force Base, New York, as surgeon of the Eastern Air Defense Force.

SYMPOSIUM ON MILITARY MEDICAL PROBLEMS AT INTERNATIONAL COLLEGE OF SURGEONS CONGRESS

Medical problems of the Navy, particularly those arising out of an atomic age, will be considered in a Navy Symposium that will feature the scientific program at the 22d Annual Congress of the United States and Canadian Sections, International College of Surgeons, in the Palmer House, Chicago, Ill., 8-12 September.

The symposium will be presented on the morning of the final day, it was announced by Vice Admiral Ross T McIntire, Chicago, executive director of the International College of Surgeons. Admiral McIntire said that the following naval officers from Washington will participate:

Captain Harry J. Alvis, Director of the Submarine Medicine Division, Bureau of Medicine and Surgery: "Submarine Medicine in the Nuclear Age."

Captain James A. Brimson, Head of the Atomic Defense Branch of the Special Weapons Defense Division, Bureau of Medicine and Surgery: "Hazards of Ionizing Radiation in Military Medicine."

Captain Gerald J. Duffner, Medical Officer of the Experimental Diving Unit, Naval Gun Factory: "Medical Aspects of Recent Trends in Diving."

Captain William M. Snowden, Head of the Special Activities Branch of the Aviation Medicine Division, Bureau of Medicine and Surgery: "Newer Concepts of Aviation Medicine."

Lieutenant Commander John H. Ebersole, Medical Officer aboard the U. S. S. *Seawolf*, nuclear-powered submarine: "Problems of Radiologic Safety Associated with Seagoing Nuclear Reactors."

The scientific program of the congress will cover all phases of surgery. The speakers will include world-renowned surgeons from four other continents as well as from the United States, Canada, and Mexico.

ANNUAL MEETING OF MILITARY SURGEONS IN WASHINGTON, D. C., OCTOBER 28-30

"Professional Excellence—The Criterion of Military Medicine" will be the theme of the 64th annual convention of the Association of Military Surgeons of the United States, which will be held at the Statler Hotel, Washington, D. C., on October 28 to 30, 1957. In addition to the program listed below, meetings of the dental, nurses, veterinary, medical specialist, and sustaining membership sections will be held.

Monday Morning, 28 October

Presidential Address—Col. Amos R. Koontz, MC, Maryland National Guard.

Panel Meeting—*Medical Education in the Federal Services.*

The Surgeons General, Army, Navy, Air Force, and Public Health Service; and Medical Director, Veterans Administration.

Moderator: Dr. Frank B. Berry, Assistant Secretary of Defense (Health and Medical).

Monday Afternoon

Presiding: Col. Joseph R. Shaeffer, MC, USA, Consultant on Medical Care in Disaster, Walter Reed Army Institute of Research, Washington, D. C.

Theme: *Disaster Medicine*

Quo Animo—Maj. Gen. Isidor S. Ravdin, MC, USAR (Ret.), John Rhea Barton, Professor of Surgery, University of Pennsylvania, Philadelphia, Pa.

Disaster Management—Part II—John M. Whitney, M. D., USPHS, Deputy Director, United States Public Health Service, Dallas, Tex. Former Medical Director, Federal Civil Defense Administration.

The Role of Blood in Disaster—Col. Douglas B. Kendrick, MC, USA, Chief Surgical Consultant, Office of the Surgeon General, U. S. Army, Washington, D. C.

Newer Medical Training Objectives in USAREUR—Maj. Gen. Alvin L. Gorby, MC, USA, The Surgeon, United States Army, Europe.

The Influence of Whole Body Irradiation on Recovery—Lt. Col. James B. Hartgering, MC, USA, Director, Division of Physiology and Pharmacology, Walter Reed Army Institute of Research, Washington, D. C.

Operation Fire Drill—U. S. A.—Maj. Gen. William Shambora, MC, USA, Commanding General, Brooke Army Medical Center, Fort Sam Houston, Tex.

A Mutual Assistance Plan for Disaster Management—Brig. Gen. Harold Twitchell, USAF (MC), The Surgeon, Continental Air Command, Mitchel Air Force Base, N. Y.

Quo Vadis—Rear Adm. Winchell McK. Craig, MC, USNR (Ret.), Professor of Neurosurgery, Mayo Foundation, University of Minnesota, Rochester, Minn.

Tuesday Morning, 29 October

Subject to be announced—Dr. Paul M. A. Linebarger, Professor of Oriental Politics, School of Advanced International Studies, The Johns Hopkins University, Baltimore, Md.

Government and Industry Today—Mr. John Connor, President, Merck & Co., Inc., Rahway, N. J.

Tuesday Afternoon

Surgery of the Large Intestine—Panel: Calvin Smyth, M. D., Philadelphia, Pa. (Chairman); Henry W. Cave, M. D., New York, N. Y.; and Harvey B. Stone, M. D., Baltimore, Md.

Wednesday Morning, 30 October

Management of Patients With Coronary Artery Disease—A Joint Medical and Surgical Panel

Medical Aspect—Wilbur D. Stroud, M. D., Philadelphia, Pa. (Chairman); George E. Burch, M. D., New Orleans, La.; and Thomas W. Mattingly, Col., MC, USA, Washington, D. C.

Surgical Aspect—Alfred Blalock, M. D., Baltimore, Md. (Chairman); Claude S. Beck, M. D., Cleveland, Ohio; and James Forsee, Brig. Gen., MC, USA, Washington, D. C.

Wednesday Afternoon

Hospital Management—Panel Meeting—Russell A. Nelson, M. D. (Chairman), Director, The Johns Hopkins Hospital, Baltimore, Md.

Others to be announced.

OFFICERS CERTIFIED BY SPECIALTY BOARDS

Supplementary Listing

According to information from the Offices of the Surgeons General of the military medical services, the following regular Medical, Dental, and Veterinary Corps officers have been certified by the boards indicated since the listings published in previous issues of this *Journal*.

American Board of Pediatrics

Enrico D. Carrasco, Lt. Col., USA
John W. George, Maj., USAF
Sigmund Schwarzer, Capt., USAF

American Board of Psychiatry and Neurology

Psychiatry

Murray E. Finn, Maj., USA
Henry K. Silberman, Maj., USA

Neurology

Harold Collings, Jr., Maj., USA

American Board of Orthopaedic Surgery

Ben A. Rutledge, Lt. Col., USA
Keith A. Walker, Lt. Col., USA

American Board of Dermatology and Syphilology

Michael J. Davis, Maj., USA
John E. Reisner, Maj., USA

American Board of Radiology

James T. Brennan, Lt. Col., USA
William C. Finlay, Capt., USAF
Charles Onstead, Capt., USA

American Board of Urology

Charles A. Moore, Maj., USA
Edward J. O'Shaughenesy, Maj., USA
Kryder E. Van Buskirk, Lt. Col., USA

American Board of Obstetrics and Gynecology

James H. Lee, Jr., Comdr., USN
Oscar J. Rosenzweig, Maj., USAF

American Board of Internal Medicine

Glen K. Arney, Maj., USA
Robert Bernstein, Lt. Col., USA
Gordon W. Briggs, Maj., USA
Ray G. Cowley, Lt. Col., USA
Robert W. Green, Maj., USA
George B. Hamilton, Maj., USA
Euclid G. Herndon, Jr., Lt. Col., USA
Harry F. Hurd, Maj., USA
Robert T. Jenson, Lt. Col., USA
Per H. Langsjoen, Maj., USA
Wendell F. Lienhard, Jr., Maj., USA
Frank L. Miller, Lt. Col., USA
James R. Mincks, Capt., USA
Nicolas H. Nauert, Jr., Lt. Col., USAF
Joel E. Reed, Maj., USAF
William R. Schillhammer, Jr., Maj., USA
Edwin S. Stenberg, Jr., Lt. Col., USA

American Board of Pathology

Claude W. Delia, Maj., USA
John M. Lukeman, Lt. Col., USA

American Board of Ophthalmology

Melvin L. Gumm, Maj., USA
Fred C. Williams, Maj., USA

American Board of Surgery

Daniel C. Campbell, Jr., Lt. Col., USAF
Carl W. Hughes, Lt. Col., USA
William M. Kefling, Maj., USA
Philip J. Noel, Jr., Lt. Col., USA
John W. White, Lt. Col., USA

American Board of Anesthesiology

John A. Jenicek, Lt. Col., USA

American Board of Preventive Medicine

Aviation Medicine

Alonzo M. Donnell, Jr., Maj., USAF
David H. Beyer, Maj., USAF

American Board of Oral Surgery

David J. Ellis, Lt. Col., USA
John E. Pleasants, Lt. Col., USA
Henry C. Thompson, III, Lt. Col., USA

American Board of Orthodontics

George H. Parrot, Jr., Lt. Col., USA

American Board of Prosthodontics

Raymond H. Osterholtz, Maj., USA

American Board of Veterinary Public Health

Donald C. Kelly, Lt. Col., USA
Leslie C. Murphy, Lt. Col., USA

BOOKS

Reviews of Recent Books

THE TREATMENT OF BURNS, by *Curtis P. Artz*, M. D., F. A. C. S., Lt. Col., MC, USA (Ret.), and *Eric Reiss*, M. D. 250 pages; 199 illustrations on 105 figures. Illustrations by *Burr Bush*. W. B. Saunders Co., Philadelphia, Pa., 1957. Price $7.50.

This short, concise but extremely informative text covering particularly the detailed management of burns is a highly welcomed volume to the medical literature. The vast experience and authoritative knowledge of the authors plus the clear, readable style of the text will find this volume being referred to frequently by all physicians responsible for the care of the burned patient. The organization of the material makes for rapid, easy reference. The detail of information is sufficient to satisfy the most critical reader. The basic pathophysiologic concepts involved are adequately reviewed. Conflicting points of view are clearly expressed. The choice of therapeutic armamentarium is based on a well-established scientific foundation. As an example, the authors identify clearly the occlusive dressing and exposure method in the treatment of burns as distinct from and not to be confused with such terminology as open or closed management since the aim of both occlusive dressing and exposure method is similar, namely, the accomplishment of a dry protective covering. Neither method is completely ideal and frequently one should complement the other. The authors are to be commended for the Herculean task of bringing together in a most acceptable form the extensive world writings on this most formidable surgical problem. This volume should find itself in the personal library of all who accept the responsibility for the treatment of burns.

—*DAVID GOLD, Col., USAF (MC)*

PRINCIPLES OF UROLOGY, An Introductory Textbook to the Diseases of the Urogenital Tract, by *Meredith F. Campbell*, M. S., M. D., F. A. C. S. 622 pages; 319 figures. W. B. Saunders Co., Philadelphia, Pa., 1957. Price $9.50.

This book was written by Doctor Campbell, who is one of the foremost urologists of our time, to serve a twofold purpose: for the instruction of the student in the broad fundamentals of urology, and as a practical guide for the physician who is not a specialist in urology. To accomplish this the author has omitted controversial points, unlikely therories, and detailed descriptions of major procedures such as are usually found in standard texts on this subject, and has described in detail, in a concise and easily understandable fashion, all of the aspects of urology that are of value to the groups for whose use the book is intended.

The subject matter is extremely well covered, and only widely accepted and up-to-date diagnostic and therapeutic procedures are presented. This book is replete with illustrations (photographic and artistic) and diagrammatic tables of the highest quality, which serve further to enhance its value. Outstanding among the tables presented are those on the "Embryonic Derivations of the Urogenital Analage" in chapter 6, and "Fluid Administration" (adults and children) in chapter 7. At the end of the book, Doctor Campbell has included a section on questions, arranged according to chapters, which gives the page reference numbers for the answers thereto. This affords an unusual and extremely desirable method for review of the subject matter, particularly for examination purposes. In keeping with the rest of the book, the bibliography and index are of the highest quality.

This book will be of inestimable value to physicians without specialized urologic training, in the management of patients with actual or suspected urologic diseases and defects, in regard to both proper diagnosis and treatment, including such procedures as urethral catherization, the passage of urethral sounds, and minor surgical procedures. It is strongly recommended also for all students, including those at the resident level.—*MARK S. CURTIS, Capt., MC, USN*

SYNOPSIS OF GASTROENTEROLOGY, by *Rudolf Schindler,* M. D., F. A. C. P. 395 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $7.75.

This book is a most inclusive synopsis of diseases in the field of gastroenterology for its size, written without any excessive verbiage, and in a most readable style. Dr. Schindler presents this book for the general practitioner as well as the specialist in internal medicine.

One of the reasons that it is a most useful book is that it is a personal summary in the practical diagnosis and treatment of gastrointestinal disorders. The author has presented us his diligent experiences of more than 35 years of practice in this field. There are no references in this book except for the general acknowledgment of five or six standard textbooks in the field of gastroenterology and associated radiology. The book is divided into 17 chapters beginning with a discussion of gastrointestinal lesions and symptoms connected with diseases of other organ systems, and closing with a presentation of general therapy of gastrointestinal diseases.

In the over-all presentation of material, the general etiology and symptoms of gastrointestinal disorders is discussed. The author then covers in concise form the various pathologic conditions and their treatment, affecting the gastrointestinal system from the mouth to the rectum. Since Dr. Schindler has been one of the pioneers in the use of a gastroscope, he states that if the clinical history is suggestive of disease of the stomach, a doctor cannot say that a certain patient has no organic disease, even if x-ray and other studies are absolutely negative, unless he also has done a gastroscopic examination. He admits, of course, that even a gastroscope has its limitations, but it does supple-

ment the radiological examination of the stomach. He also maintains that when gastrointestinal disease is suspected, that in addition to a detailed history and physical examination, the other studies must include fluoroscopy of the chest and x-ray of the entire gastrointestinal tract, including a barium enema and a gallbladder series. Dr. Schindler may be over-emphasizing laboratory and x-ray procedures but in the individual patient all these procedures must be considered if the patient's symptoms suggest disease. He emphasizes the importance of a detailed, carefully performed physical examination, and comments that even though a patient may seem to have no organic disease, he should not be told that there is "nothing wrong with him," but should be told that "no disease has been found as a result of all these thorough examinations and tests."

This synopsis of gastroenterology is an up-to-date book, and carefully compiled as a practical reference volume for the hospital resident, as well as the internist and general practitioner. Other volumes would have to be consulted for theoretical concepts and discussion of controversial aspects of gastroenterology. This book is highly recommended for any hospital or private professional library.

—*U. R. MERIKANGAS, Col., MC, USA*

CLINICAL ELECTROCARDIOGRAPHY, Interpretation on a Physiologic Basis, by *Manuel Gardberg*, M. D., with Chapters by *Richard Ashman*, Ph. D., *Irving L. Rosen*, M. D., and *Louis Levy*, II, M. D. 315 pages; illustrated. Paul B. Hoeber, Inc., Medical Book Department of Harper and Brothers, New York, N. Y., 1957. Price $12.75.

The stated purpose of this 315-page, profusely and well-illustrated text, is to present the physiologic principles upon which electrocardiography is based and to demonstrate by visual means the electrocardiographic alterations that are produced by physiologic as well as pathologic variations. The author and the contributors to this text have succeeded in accomplishing this goal. The conventional standard limb leads and unipolar limb leads are illustrated as a projection of the derived spatial QRS loop and the precordial leads by the solid angle method. A simple means of utilizing a model spatial QRS loop projected upon the frontal plane is used as an effective teaching aid. The major value of this book is the clear presentation by these means of the changes of the QRS and T deflections that result from normal variations, particularly those of cardiac position. Adding greatly to its worth is the contribution of Richard Ashman who presents a clear and concise discussion of the mechanisms of A-V conduction disturbances and the arrhythmias.

It is unfortunate that the established clinical value of the precordial leads is minimized by the author. The use of multiple precordial leads is not adequately discussed and the value of exploratory leads ignored. An almost total reliance on the use of the limb leads by construction of a frontal plane QRS-T loop is the major defect in this otherwise excellent presentation. Another deficiency is that interpretation of P-wave variations is neglected. Issue might also be taken with the

interpretation given to ST-T wave variations, although the author admits that proper evaluation usually depends upon the experience of the observer.

In summary, this book should not be considered a reference text for all the problems encountered in electrocardiographic interpretation. Rather its value lies in the clear method of presentation of the basic concepts which will properly orient the beginner, emphasizing the hazards of empiricism to those more experienced, while to the teacher it offers a method whereby the physiologic principles of electrocardiography may be effectively presented.

—*LOREN F. PARMLEY, Lt. Col., MC, USA*

MODERN TRENDS IN GERIATRICS, edited by *William Hobson*, B. Sc., M. D., D. P. H. 422 pages; illustrated. Paul B. Hoeber, Inc., Medical Book Dept. of Harper & Bros., New York, N. Y., 1957. Price $13.50.

This British publication, composed of 17 chapters on carefully chosen topics, is a fairly comprehensive review of gerontology, with an adequate bibliography for each subject. The first chapter gives one a good perspective as to the current and anticipated impact of aging, as shown by the estimate that 20 per cent of the British population will be eligible for pension by 1980 (similar to the trend in the United States). This is followed by objective evaluation of aging by biologic, biochemical, and psychologic measurements. The specific and detailed discussions of the basic diseases of the aged are interesting. The term *chronic bronchitis* appears to be similar to what is called *pulmonary emphysema* in the United States.

This text adequately summarizes the positive approach and optimism one must acquire in the total care and rehabilitation of the aged. It should be of particular value and interest to internists, general practitioners, and social service workers both in Britian and in the United States.— *JOHN B. MacGREGOR, Capt., MC, USN*

ATLAS OF CLINICAL ENDOCRINOLOGY, Including Text of Diagnosis and Treatment, by *H. Lisser*, A. B., M. D., and *Roberto F. Escamilla*, A. B., M. D. 476 pages; 148 plates including 3 in color. The C. V. Mosby Co., St. Louis, Mo., 1957. Price $18.75.

As the authors state, there are many excellent textbooks of endocrinology, well illustrated but still presenting the subject primarily by the written word. Intending this to be an atlas of practical endocrinology for clinicians, the authors use the welcome pictorial approach. Drawing mainly from their extensive source of patients at the University of California School of Medicine clinics and supplementing it where necessary with sketches or loaned photographs, they present an amazingly complete coverage of the endocrinopathies in less than 500 pages.

The typical case photographs, taken serially when progression or response to treatment is pertinent, make an indelible imprint on the reader's memory, coming as close to bedside rounds as literature can. Concise case histories add to the vivid portraits, so that any observant

clinician, not particularly schooled in endocrinology, should be guided to proper diagnosis. To complete the subject coverage, laboratory findings and charts of endocrine development norms are included, but the emphasis is kept clinical.

It is refreshing to have the authors present their specific recommendations as to case management rather than merely list the possible therapeutic programs, which often leave the less-experienced physician in a maze of indecision. Certainly Doctors Lisser and Escamilla have every right to speak with authority, and their opinions are of infinitely more value than any complied list of alternatives.

This beautifully presented atlas is a welcome and most heartily recommended addition to the library of every clinician and is an absolute necessity for the practicing endocrinologist. Despite the hundreds of excellent photographs, some in color, the price of the atlas is within the general range expected for good medical textbooks.

—FRANCIS G. SOULE, Jr., Capt., MC, USN

BLOOD AND BONE MARROW PATTERNS, by *G. D. Talbott*, M. D.; *Elmer R. Hunsicker*, B. S.; and *Jonab Li*, M. D. 59 pages; illustrated with 145 colored photomicrographs. Grune & Stratton, Inc., New York, N. Y., 1957. Price $12.

This book departs from the usual publications in the field of hematology in that it presents blood and bone marrow *patterns* along with cell morphology. The blood cell series and the cell patterns of the various disease states are included in the book.

A brief description of each cell appears on the page facing the photograph of that cell, thus linking description and cell. This eliminates searching the text in an effort to link the two, a common fault of many of such textbooks.

The photomicrographs, all in color, can only be spoken of in superlatives. They are truly outstanding. The authors are to be commended for their fine work. No other text in the field quite equals this one in this respect.

Clinical data is not included and none is necessary if the book is used as it should be—as an adjunct to a good standard textbook of hematology.

The Atlas is of value to the teacher as well as to the student. It is almost a must for the general practitioner who wishes to make a diagnosis and follow his own cases of this type. The book should be in the library of every physician who has an interest in the field of hematology.

—WILLIAM G. DUNNINGTON, Lt. Col., MC, USA

FUNDAMENTALS OF MICROBIOLOGY, by *Martin Frobisher*, Sc. D. 6th edition. 617 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1957.

This is a new edition of a reliable textbook covering the entire field of microbiology. Designed for college students who are not necessarily specializing in microbiology, the book has been written in a most

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interesting and readable style and covers viruses, rickettsiae, and fungi as well as bacteria. Physicians wishing to review the basic fundamentals of the field of microbiology, especially the more recent changes, will find the book an excellent one.

The references at the end of each chapter are current and, while many important individual references to classical papers have been left out, the author has made provisions to cover this minor fault by including references to textbooks and review papers covering the earlier more classical work.

The author has drawn generously from many sources an excellent collection of photographs to supplement his readable text, the combination producing a very clear, concise, and accurate survey of microbiology. This is a textbook that should find a place in the library of anyone interested in keeping up with the latest advancements in this field.—*DAVID F. HERSEY, Capt., USAF (MSC)*

PERINATAL LOSS IN MODERN OBSTETRICS, by *Robert E. L. Nesbitt, Jr.*, M. D. A Series of Monographs in Obstetrics & Gynecology, edited by *Claude E. Heaton*, M. D. 432 pages; 108 illustrations including 10 in color. F. A. Davis Co., Philadelphia, Pa., 1957.

Until recently, perinatal mortality has not received the interest or attention of maternal mortality. Drawing from his clinical and pathologic experience at Johns Hopkins University, Dr. Nesbitt now gives us a reference volume on perinatal loss.

The first portion of the book deals with statistical analysis and classification based upon the groupings of the World Health Organization, *i. e.*, early fetal death, intermediate, and late fetal death, and additionally includes a section on prematurity. The second portion covers specific causes of fetal death, *i. e.*, anoxia, birth injury, malformations, infections, hemolytic disease, multiple gestation, ectopic gestation, analgesia and anesthesia, and factors in prevention of perinatal loss. The appendix contains a perinatal mortality code sheet valuable for conference use.

This new volume is a readable, well-illustrated, thorough survey of this important subject, which includes new and original work in addition to an extensive and usable bibliography. It is required reading for obstetricians, pediatricians, and pathologists.

—*WILLIAM C. HERNQUIST, Lt. Col., USAF (MC)*

CLINICAL NEURO-OPHTHALMOLOGY, by *Frank B. Walsh*, M. D., F. R. C. S. (Ed.), D. Sc. (W. A.-Hon.) 2d edition. 1,293 pages; illustrated. The Williams & Wilkins Co., Baltimore, Md., 1957. Price $29.

This book is the most complete publication on the subject of neuro-ophthalmology in print today. The chapters are well organized to allow the reader to quickly refer to the type of case in mind. The individual diseases discussed are well outlined, yet in sufficient detail to give the reader a clear, concise résumé of the history, signs, symptoms, and

pathology of each condition described. The style of writing stimulates the reader's interest to follow the discussion to completion. The abundance of reference material cited at the end of each disease described gives authenticity to the statements made. The author gives full credit to previous writers in instances wherein his own experience with a particular condition is lacking.

This volume provides the experienced ophthalmologist with a ready reference to any particular type of case and, at the same time, affords the less experienced the opportunity to study neuro-ophthalmologic conditions as part of a group. The illustrations are numerous and have been chosen well to depict the typical conditions described. The chapter on "Tumors and Related Conditions" is considered to be one of the best presented sections of the book. The inclusion of a paragraph on treatment in many of the conditions described adds greatly to the value of this work as a reference book.

—*JACK H. BRISTOW, Col., USAF (MC)*

THE YEAR BOOK OF THE EYE, EAR, NOSE AND THROAT (1956-1957 Year Book Series). The Eye, edited by *Derrick Vail*, B. A., M. D., D. Oph. (Oxon.), F. A. C. S., F. R. C. S. (Hon.). The Ear, Nose and Throat, edited by *John R. Lindsay*, M. D. 448 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $7.

This outstanding edition of the Year Book series presents impartially selected condensations of the more leading and timely articles relating to the eye, ear, nose, and throat from the World's journals received between October 1955 and September 1956.

Of the book's 448 pages, half are devoted to ophthalmology, which is further divided into 11 major headings. The ENT section is arranged within 14 groupings. The masterfully selected articles are of significant importance in describing and explaining the newer diagnostic and therapeutic approaches to the problems of eye, ear, nose, and throat.

Both the eye and ENT sections are replete with excellent diagrams, charts, and illustrations. The editorial supplements reflect the vast experience and status of the commentators, adding to the interest and interpretation of the articles.

The printed slip of 23 questions on the articles in the book should be made a permanent page at the end of the volume. The index, both by subject and author, is of value in using the book as a reference. The volume is a must for every physician interested in ophthalmology and otolaryngology. Inasmuch as these specialties must be considered mature and independent, many interested physicians will be glad to note the replacement of the 1957-1958 series of the *Year Book of Eye, Ear, Nose & Throat* by two volumes; one, *The Year Book of Ophthalmology*, and the other, *The Year Book of Ear, Nose and Throat* (including a section of maxillofacial surgery).

—*LE ROY E. WIBLE, Capt., MC, USN*

MODERN OPERATIVE SURGERY, in Two Volumes. Volume II, edited by the late *G. Grey Turner*, LL. D., D. Ch., M. S., F. R. C. S., F. R. A. C. S., and *Lambert Charles Rogers*, V. R. D., M. Sc., M. S., F. R. C. S., F. R. C. S. E., F. R. A. C. S., F. A. C. S., with a foreword by Sir *Gordon Gordon-Taylor*, K. B. E., C. B., M. A., LL. D., Sc. D., M. D., M. S., F. R. C. S., F. R. C. S. E., F. R. C. S. I., F. R. A. C. S., F. A. C. S. 4th edition. 2,614 pages; illustrated. Paul B. Hoeber, Inc., New York, N. Y., 1957. Price $17.50.

This work of 38 contributors from the British Empire covers the whole field of operative surgery and the surgical specialties. The virtue of having basic information concerning every facet of the field of operative surgery is offset by the fact that in many details obsolescence has already set in before the reader gets the book. The bulk of the book is standard material that has permanent value. The tremendous amount of work that went into preparing this work is partially wasted because it has lost the freshness and newness that would make possession of the set a delight to the owner.

Examples of the outdating of some material are: "Diphtheria offers the widest sphere of usefulness (for tracheotomy)." "The dressing (for laryngectomy) should be just tight enough to give a slight cyanosis of the lips and the ears." "Herniorraphies are kept in bed for 21 days postoperatively." "Use catgut in tying off omentum because omentitis sometimes follows the use of silk." In the section on "Rectum and Anus" it is stated that 12 percent of the fistulas in ano are tuberculous. Colon preparations are of streptomycin and a sulfa drug, and newer preparations are not mentioned. These are typical examples of differences from common practices and experiences in this country. Certain practices of British physicians are noted by innuendo, such as that of otologists to do the surgery on otogenic brain abscesses is an example. Another is the specific comment that in excision of an eye "everyone wears rubber gloves."

The most interesting and helpful parts of this work are in the philosophies expressed, as in excerpts from Gordon Grey Turner's introduction: "The measure of surgical skill is efficiency." "The correct operation clumsily performed is much more likely to be successful than the wrong operation no matter how brilliantly performed." In discussing the operability of certain malignant lesions he quotes:

> "The abyss is worth a leap, however wide,
> When life, sweet life, is on the other side."

The book is mechanically well done; it is well indexed, anatomic descriptions are uniformly excellent and lucid, and footnotes give bibliographic references and occasional editorial annotations. The references are usually hallowed with age. The print is of a size to permit the mature surgeon to read it with ease. The quantity of material, the extremely wide but somewhat outdated coverage of a vast subject, the detail expressed, and the cost, however, make it probable that most busy surgeons or students will not take the time to read nor assume the expense to own this work.—*DON S. WENGER, Col., USAF (MC)*

SURGERY, Principles and Practice, by *J. Garrott Allen*, M. D.; *Henry N. Harkins*, M. D., Ph. D.; *Carl A. Moyer*, M. D.; and *Jonathan E. Rhoads*, M. D., D. SC. (Med.), with 32 contributors. 1,495 pages; 623 illustrations. J. B. Lippincott Co., Philadelphia, Pa., 1957. Price $16.

The most severe criticism that could be made of this weighty tome (8 pounds, 1,445 pages) is that perhaps it attempts to do too much for too many. Possibly it should be divided into two or more volumes for ease of reading and for its value to the student for the principles of surgery and its value to the surgeon in the practice of surgery, although it often is difficult to draw the line between the principles and the practice. The book is written in clear, concise, grammatical English (which is not found too frequently), and the illustrations for the most part are really explanatory. Chapter 1, "The Philosophy of Surgery," should be required reading for every premedical and medical student, while the older surgeon will find in it an excellent restatement of his credo as originally defined by Hippocrates.

The portion on principles of surgery takes up stages of wound healing, fluid balance, chemistry, physiology, anatomy of the systems, treatment of burns, electrolite balance and blood transfusions. The dangers and abuses of the latter are well stated. This portion is written with authority and attractively presented, so much so that it is difficult to stop reading once one has started.

The section on the practice of surgery is amazing in the amount of ground that it covers and the excellent manner in which this is done. Practically all the systems and specialties are dealt with in detail. The articles on the stomach, intestines, pancreas, spleen, adrenals, and liver, with their many diseases and the differential diagnoses of their various dysfunctions, are comprehensive, complete, and authoritative. The specialties also are well represented, with excellent sections on orthopedics, both traumatic and nontraumatic, and thoracic, abdominal, genitourinary, gynecologic, and plastic surgery. The article on hernias is very good, although in my opinion the author is too much inclined to favor the Cooper's ligament repair, which has not had sufficient time to prove itself so far as late recurrences are concerned. Some of the illustrations in this section lack the clarity displayed by others in the book. In the section on plastic surgery, there is an error in labeling C and C prime in figure 477A on page 1180. This would alter the technic of the operation described, if one were not aware of it. Otherwise this portion of the book is well worthwhile.

Many articles of great value that are not found in most books on surgery are included in this volume. I refer particularly to the sections on surgery of the hand, surgery of pulmonary tuberculosis, peripheral vascular surgery, and pediatric surgery. At long last we have an excellent presentation of the latter as differentiated from surgery of the adult. The division on military surgery is most timely and well done.

Malignant tumors are discussed as a whole and as found in each system of the body, along with the surgery, radiation therapy (advan-

tages and dangers of), and current chemical and endocrine factors used for their curative or palliative qualities.

This is the finest book on the subject of the principles and the practice of surgery that has been published. It will be of great value not only to the medical student, intern, and resident, but also to the actively practicing surgeon who wants a rapid review of the principles and technics of the more commonly performed operations. Certainly it should be in every medical library, and I am sure that a great many surgeons will find it indispensable.—*LAWRENCE L. BEAN, Capt., MC, USN*

THE YEAR BOOK OF ORTHOPEDICS AND TRAUMATIC SURGERY (1956-1957 Year Book Series), edited by *Edward L. Compere*, M. D., F. A. C. S., F. I. C. S. 336 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $6.75.

As in the past, this volume should be of interest to surgeons in general and orthopedic surgeons in particular as a concise review of pertinent current orthopedic literature. Representative orthopedic articles, published in medical journals between November 1955 and November 1956, are abstracted in a clear and well-written manner. The illustrations are well reproduced and the editorial comments are thoughtful. The articles are selected and grouped to reveal current trends in this field. Up-to-date information is presented regarding such timely problems as geriatrics and osteoporosis, nonunion of fractures, internal fixation of fractures, bone grafts and bone banks, treatment of tuberculosis, intervertebral disk lesions, "whiplash" injuries, treatment of arthritis, and use of antibiotics. The volume provides a good reference work for a more detailed study of the original article.

—*EARL W. BRANNON, Lt. Col., USAF (MC)*

SURGICAL GYNECOLOGY, Including Important OBSTETRIC OPERATIONS, A Handbook of Operative Surgery, by *J. P. Greenhill*, M. D. Illustrated by *Angela Bartenbach*. 2d edition. 377 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $9.50.

This monograph in atlas form is written expressly for the student, gynecology resident, and general practitioner who does occasional gynecologic surgery. The text is easily understood and is excellently supported by 107 pen and ink plates.

The book is divided into four major sections, the first of which is on Preoperative Preparation and Postoperative Care and Complications. These are presented adequately, and the section is well worth reading by anyone doing pelvic surgery. The other sections deal with Vulvar and Perineal Operations, Vaginal Operations, and Abdominal Operations. In these sections the author has included all the usual gynecologic procedures, plus some urologic and general surgical procedures for repair of bowel and urinary tract injuries resultant from operations in the pelvis. In general the book is well organized and very easily assimilated. It is a must for all students and residents in gynecology, but will not materially aid the specialist in this field.

—*WILLIAM S. BAKER, Jr., Capt., MC, USN*

1957 MEDICAL PROGRESS, A Review of Medical Advances During 1956, by *Morris Fishbein*, M. D. 367 pages. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1957. Price $6.

Again the editor has succeeded in publishing, in concise, readable form the best from the 1956 medical literature. Ably assisted by 29 contributors, who for the most part are authorities in their respective fields, the outstanding advances and achievements during the year are reported on entire subjects such as general surgery to single disease entities such as diabetes by the famed Dr. Elliott P. Joslin.

There is little to be criticized in the volume with the possible exception of too much space being devoted to subjects of restricted interest. For those who seek a quick source of information covering recent advances, the book is valuable and for those who wish to cover a subject more extensively, the bibliography is very complete. It is manifestly impossible to pay tribute to each investigator and each achievement recorded within the year as time and space will not permit.

—*MELVILLE M. DRISKELL, Capt., MC, USN*

THE LEUKEMIAS: Etiology, Pathophysiology, and Treatment, edited by *John W. Rebuck, Frank H. Bethell,* and *Raymond W. Monto.* A Henry Ford Hospital International Symposium. 711 pages; illustrated. Academic Press, Inc., New York, N. Y., 1957. Price $13.

This is a comprehensive, up-to-date volume on the leukemias. It consists of an edited collection of papers presented at the International Symposium on the Leukemias: Etiology and Pathophysiology, held at the Henry Ford Hospital, Detroit, Mich., 8-10 March 1956.

The work represents the efforts of 57 participants. All are outstanding authorities on the leukemias and related entities. The majority of the contributors are from the United States. England, Canada, France, Denmark, Italy, and Switzerland are represented by leading individuals in the field. There are 39 chapters divided into eight general areas of discussion as follows: the leukemic cell, its structure and antigenicity; genetic and environmental factors in the transmission of leukemia; radiation biology of leukocytes; the leukemias and the malignant lymphomas; leukocytic physiology; metabolism of amino and nucleic acids in the leukemias; further biochemical considerations in the leukemias; and nucleic acids as the target for chemotherapy, mechanisms of drug action and resistance.

As pointed out in the preface, this volume gives the present complex position of leukemic etiology and pathophysiologic disturbance, a much needed knowledge of detailed leukocytic functions and comprehensive thought on the therapy of the leukemias. It establishes the basis of comparison in the earlier works in this field and points up the extensive and accelerated progress made in the last few years.

This book is highly recommended for anyone concerned with physiology or pathology of the leukocytes.

—*FRANK M. TOWNSEND, Col., USAF (MC)*

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY, Held in Geneva, 8 August-20 August 1955. Volume 11, "Biological Effects of Radiation." 402 pages; illustrated. *United Nations Publications*, 1956. Distributed by Columbia University Press, New York, N. Y., 1956. Price $8.

This volume is one of 16 comprising the Proceedings of the International Conference on the Peaceful Uses of Atomic Energy held in Geneva, Switzerland, in August 1955. It is not, of course, arranged as a textbook, but for anyone who is acquainted with the fundamentals of radiobiology it is a superb review of the problems with which the science is concerned at the present time. This was to be expected, when every country represented picked the best men and the most representative articles for presentation at this meeting.

These articles are, for the most part, of general interest as compared to the average article in a scientific journal dealing with minute and detailed research into specialized aspects of a subject. Tsuzuki, Japan's leading radiobiologist, is the author of "Bio-Medical Effects of Nuclear Energy," the "Early Effects of Radiation Injury," and "Injury due to Radioactive Fall-out." In this last article, which presents the cases of the Japanese fishermen of the fishing boat "Lucky Dragon" who were caught in the fall-out of the megaton weapon in March of 1954, it is interesting that Professor Tsuzuki lists first among the causes of the liver disease suffered by these fishermen, serum hepatitis caused by repeated transfusions.

Professor Bacq of Belgium, who has done an immense amount of work on chemical protection against radiation, has an article on this subject, but to offset presenting the views of only one man, no matter how eminent, there are several articles by other authorities on protection by chemical and other means. Muller, the Nobel Prize winner, presents in a masterly fashion some of the genetic problems posed by radiation in his paper "Radiation and the Genetic Constitution." Looney, who has worked for a number of years collecting data on patients who have had radium and thorium administered to them, has an article on "Radium and Thorium Excretion in Man." There is an article on the "Effect of Radiation Dose and Shortening of Life Span," by Blair of Rochester, in which his concept of the mathematical representation of the relationship between radiation dose and life span is set forth.

Any critical comments are of minor importance and do not detract greatly from the value of the book. In the preface it is stated that editing for style was minimal in the interests of early publication, and misprints and incorrect or awkward diction are frequent.

The volume is well bound, the paper and printing are of good quality, and the photographs are well reproduced. The book is highly recommended to all who are interested in the field of radiobiology.

—JOHN A. O'DONOGHUE, Capt., MC, USN

BRITISH MEDICAL BULLETIN, Volume 13, Number 1, January 1957, "Physiology and Pathology of the Kidney." 74 pages; illustrated. Published by the Medical Dept., The British Council, London W1, England. Distributed by Oxford University Press, New York, N. Y., January 1957. Price $3.25.

This volume in the series of the British Medical Bulletin is composed of 16 articles dealing with the pathology and physiology of the kidney. The articles are written by a group of clinical investigators, pathologists, radiologists, physiologists, biochemists, and medical physicists headed by Professor Robert Plart of the University of Manchester.

Each article is prefaced by an outline of its contents. Physiologic principles are discussed in the light of recent research. These are didactic presentations with many references to experimental literature. The reproductions of radiographs and photomicrographs are excellent.

This is a stellar assembly of the latest known facts pertaining to the basic sciences of the kidney, unusually well organized, and beautifully presented. For the residency training program, not only in urology but other specialties, it serves a real and valuable purpose. Multiple sources of information, each authoritative, are represented. It is exceedingly useful as a library file for reference in looking up specific and special information during the first two years of residency training. The great detail in which the varied subjects are presented will satisfy the most zealous reader or student.—*EARL C. LOWRY, Col., MC, USA*

EPILEPSY, Grand Mal, Petit Mal, Convulsions, by *Letitia Fairfield*, C. B. E., M. D., D. P. H. 159 pages; illustrated. Philosophical Library, Inc., New York, N. Y., 1957. Price $4.75.

This small volume appears to be designed chiefly for social workers, teachers, and officials whose duties are concerned with epileptics. However, it is of value to physicians and students who are interested in the problems that arise in the social and economic adjustment of the epileptic child or adult.

The book deals briefly, though adequately enough considering the purpose for which it was written, with the history, diagnosis, and treatment of the various forms of epilepsy. It contains a discussion of the various problems that arise in the social or economic adjustment of epileptics in school, the community, or on the job. The problems of institutional care are considered at length and the legal aspects and laws concerning epileptics are discussed. Since the author is British, these problems are discussed from that viewpoint, and the various British institutions and agencies available to the epileptic in England are listed. To some degree this makes the book of more immediate value to a worker in Great Britian. Nevertheless, it can be of considerable value to the worker in this country as the author's statements are sound and sensible. The book is simply and clearly written. It is recommended to all those whose work involves the treatment and care of epileptics.—*JAY F. TUTTLE, Lt. Col., MC, USA*

HEMORRHAGIC DISEASES, by *Armand J. Quick*, Ph. D., M. D. 451 pages; 37 illustrations. Lea & Febiger, Philadelphia, Pa., 1957. Price $9.50.

An excellent text for the practicing hematologist and internist. The author's vast experience in the field of blood dyscrasias serves him well in handling an extremely difficult field of many diverse opinions. The scope of the book is comprehensive. Its historical aspects are both delightful and revealing but are marred at times by the author's tendency to emphasize repeatedly his contributions and criticisms sustained. New advances in the field of coagulation, hemostasis, and thrombocytopenia are well described. The method of presentation is effective, but occasionally suffers from rambling discussion. Ideas are presented clearly, discussed thoroughly, and logically summated. The bibliography constitutes an excellent compilation of the classics in the field. The second section of the book is devoted to laboratory methods, descriptions are adequately presented and the comments and suggestions will be helpful to those interested in technics. This is an exceedingly good book and is recommended for all interested in the field of hematology.— *JOSEPH H. AKEROYD, Lt. Col., MSC, USA*

GOUT, by *John H. Talbott*, A. B., M. D., D. Sc. (Hon.). 205 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $6.75.

This short but thorough monograph is a complete revision of the author's earlier work, "Gout and Gouty Arthritis," which was published in 1953. The present work is replete with illustrative material including graphs, roentgenograms, and photographs in color and black and white. The coverage of the subject is extensive and thorough with every imaginable facet of gout represented under chapters dealing with history, definition, heredity, metabolism of uric acid, precipitating agents, and many other chapters in addition to the usual ones on diagnosis, differential diagnosis, etiology, et cetera. The bibliography consists of 285 references.

The monograph serves a very valuable function in bringing together in one work all the various metabolic, clinical, therapeutic, and laboratory aspects of a much written-about but still poorly understood subject. The coverage ranges in its scope from the historical aspects to the latest in research developments. Both theoretical and practical material are integrated so as to aid in the understanding of clinical cases. Therapy of the acute and chronic forms of the disease is very well covered.

I would classify this book as one useful primarily for the internist whether he be rheumatologist or general internist, since this disease enters the picture in the differential of every patient manifesting joint abnormalities, kidney failure, renal calculi, albuminuria, and even hypertension. Familiarity with this condition is especially important because it is one disease in which we have some measure of controllability, amidst so many others considered in its differential, for which our armamentarium is so inadequate or futile.

—*DAVID L. DEUTSCH, Lt. Col., MC, USA*

PSYCHOTHERAPY OF THE ADOLESCENT, edited by *Benjamin Harris Balser*, M. D. 270 pages. International Universities Press, Inc., New York, N. Y., 1957. Price $5.

This book is the outgrowth of a symposium on psychotherapy of the adolescent that was conducted in May 1955 at the meeting of the American Psychiatric Association in Atlantic City. Its aim is to provide a reference source for psychotherapy of the adolescent but, in the reviewer's opinion, is not a reference book on the subject. One could not, for example, obtain specific information regarding the treatment or scope of alcoholism or drug addiction in adolescents; yet, it is more useful and much more readable than the usual reference book. Diagnostic categories are rarely mentioned, the psychiatric problems of adolescents being treated from the standpoint of intensity or degree of disturbance. The reader follows the treatment of adolescents in private practice, in private practice plus school practice, in school practice plus some inpatient treatment, in the outpatient clinic, in a pediatrics inpatient service, and in an intensive hospital treatment setting. He sees how school teachers can and do handle superficial psychotherapeutic problems as they arise.

The authors in each case are very well qualified to discuss their particular subject, and they draw upon a wealth of experience. Each expresses his opinion freely, unaware of what the other contributors had written. Despite this, a surprising unanimity of opinion obtains throughout.

Each chapter and section is illustrated with interesting and informative case summaries. In addition, one chapter is devoted to a verbatim psychotherapeutic interview with an adolescent, and includes pertinent dynamic comments. Each major section is well summarized and clarified by a discussant. These factors, along with the excellent organization of the book, make it extremely readable and interesting, and give it a continuity most symposia lack. Adolescence emerges as a much more understandable and less frightening period with which to deal therapeutically. It is seen in broad perspective for a better understanding of its normal developmental phenomena. The authors, for the most part, deal in specifics rather than generalities so that one can learn a great deal about adolescents and their treatment from this book. Much information emerges that is valuable with regard to preventive measures that can be used during this age period, particularly with reference to the role of the school.

This is an extremely readable, informative, concise, relatively brief book that fills a vital need in psychiatric literature and training. The book is highly recommended for anyone doing psychotherapy with this age group, and should be of considerable interest to all psychiatrists, psychologists, social workers, pediatricians, general practitioners, and others concerned in the teaching and education of this age group.

—DASIL C. SMITH, Lt. Col., USAF (MC)

DISEASES AND DISORDERS OF THE COLON, by *Anthony Bassler*, M. D., F. A. C. P., F. A. C. G., LL. D. 217 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $6.75.

This book is unique in that it contains no formal bibliography. The opinions expressed in it are largely the author's own viewpoints, based on his wide experience and rich store of clinical material gleaned during his many years of practice in a large metropolitan center.

To cover diseases of the colon adequately in 200 pages is an almost impossible task and of necessity many facets of the subject are touched on lightly or omitted entirely. As might be anticipated from one who has lived through many decades of gastroenterologic opinion, the author has formulated many of his own theories on bowel dysfunction and treatment. Some of these are at variance with those currently held. For example, he believes that chilling of the abdomen may be a cause of acute colitis, that infections of the head and throat may be significant in the etiology of ulcerative colitis, and that the terms irritable or unstable colon should be dropped from the medical literature and replaced by "entity names instead." A lengthy chapter is devoted to what the author terms "Chronic Biotoxic Intestinal States," which he believes are manifested by such ill-defined symptoms as belching, excessive flatus, fatigue, weight loss, mental depression, abdomen colic or cramping, skin disorders, back and leg pains, excessive passage of mucus, hyperacidity, et cetera. These "biotoxic states" he thinks may be caused by "the swallowing of infection from the mouth (sepsis, pyorrhea), throat (infected tonsils), tracheobronchial tract and cranial sinuses, or may result from intestinal stasis, kinks, ptosis, bands, et cetera."

Some of the therapeutic measures recommended hark back to bygone days and are no longer generally employed—the treatment of acute appendicitis with sterilized sulfanilamide intraperitoneally, the use of intravenous Mercurochrome and Bargen's vaccine for ulcerative colitis, the administration of Salvarsan, Neosalvarsan, or Mapharsen (no mention of penicillin) for syphilitic ulceration of the bowel and rectum, the giving of thyroid extract for intestinal influenza, and the use of deep x-ray therapy for diverticulitis.

Certain chapters in the book seem to be miscaptioned. The chapter on "Parasitic Diarrheal Infestations" includes the diarrheas due to parathyroid disease, hypoadrenalism, and hyperthyroidism as well as a section on staphylococcus dysentry. A later chapter entitled, "Parasitic Disorders" fully covers parasitic disease of the bowel. The chapter on "So-called Functional States," includes such unrelated subjects as intra-abdominal or visceral injuries, foreign bodies in the intestine, intestinal sand, and enteroliths.

While this book contains much that is valuable for the clinician, it could be greatly improved by careful editing, revision, and consolidation.—*EMMETT L. KEHOE, Col., MC, USA*

BRAIN MECHANISMS AND DRUG ACTION, A Symposium. Fourth Annual Scientific Meeting of the Houston Neurological Society, Texas Medical Center, Houston, Tex. Compiled and edited by *William S. Fields*. 147 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $4.25.

Relatively new drugs, such as reserpine and chlorpromazine, have aroused considerable interest in regard to their precise mode of action on the nervous system. Some of the recent basic research attempting to clarify this problem is reflected in this symposium.

How do these drugs accomplish their purpose? Perhaps with this in mind, the symposium opens with a prospectus of reticular formation neurophysiology. Dr. Robert B. Livingston finds that the cortex, via centrifugal fibers to the reticular formation, may have the capacity to regulate the arousal response and even the content of consciousness. Bearing these connections in mind, it becomes a little easier to understand that drugs acting on the reticular formation may have psychic, emotional, or other effects, such as parkinsonism. This is elaborated by Drs. Harold E. Himwich and Franco Rinaldi, who conclude that these drugs have an upward centripetal or a downward centrifugal effect. By specificity of drug or dosage, the upward or downward effects may be those of depression or stimulation.

In an attempt to deal with fundamental units, the neuron and the synapse, Dr. Amedeo S. Marazzi studied the transmission of evoked potentials of these units when influenced by the action and counteraction of various agents, including psychotogens, hallucinogens, and tranquilizers.

By what selective influence do these drugs act? Drs. Eva King Killam and Keith F. Killam investigated drug effects on different sites along neuroaxis afferent pathways, such as lemniscus, capsule, and reticular formation. Dr. Roger Guillemin demonstrated some of the endocrine implications. The broader aspect of certain drug effects on behavior of laboratory animals was explored by Dr. Joseph V. Brady, using the free operant technic. In a masterful summary, Dr. David McK. Rioch integrates the previous contributions and discusses other aspects of the problem.

For those with special interest in psychic pharmacology, a few pleasurable and informative hours may be well spent by perusal of this symposium. The bibliography appended to each of the six major contributions references further sources on other phases of these subjects.

—*ARTHUR J. LEVENS, Lt. Col., MC, USA*

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New Books Received

Books received by the *U. S. Armed Forces Medical Journal* are acknowledged in this department. Those of greatest interest will be reviewed in a later issue.

THE PHYSIOLOGY AND BIOCHEMISTRY OF LACTATION, by *S. J. Folley,* D. Sc., Ph. D., F. R. S. 153 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.75.

PHYSIOPATHOLOGY OF THE RETICULO-ENDOTHELIAL SYSTEM, A Symposium organized by The Council for International Organizations of Medical Sciences, established under the joint auspices of UNESCO and WHO. Edited under the direction of *B. N. Halpern, B. Benacerraf,* and *J. F. Delafresnaye.* 317 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $9.

FUNDAMENTALS OF GENERAL SURGERY, by *John Armes Gius,* M. D., D. Sc. (Med.), F. A. C. S. 720 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $12.50.

SPONTANEOUS AND HABITUAL ABORTION, by *Carl T. Javert,* M. D. 450 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1957. Price $11.

SURGEONS ALL, by *Harvey Graham,* M. D. Foreword by *Oliver St. John Gogarty.* 459 pages; illustrated. Philosophical Library, New York, N. Y., 1957. Price $10.

MEDICAL NURSING, by *Amy Frances Brown,* R. N., B. Ed., M. S. in N., Ph. D. 3d edition. 947 pages; 447 illustrations, 42 in color on 32 figures. W. B. Saunders Co., Philadelphia, Pa., 1957.

THE PATHOGENESIS OF CORONARY OCCLUSION, by *A. D. Morgan,* M. A., M. D. With a foreword by *John B. Duguid,* M. D. 171 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $8.50.

ATLAS OF EYE SURGERY, by *R. Townley Paton,* M. D., F. A. C. S.; *Herbert M. Katzin,* M. D., F. A. C. S.; and *Daisy Stilwell,* Illustrator. 248 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1957. Price $15.

AN ATLAS OF CARDIAC SURGERY, prepared by *Jorge A. Rodriguez,* M. D. 250 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1957.

DENTAL CLINICS OF NORTH AMERICA, Symposium on Emergencies in Dental Practice. *James R. Cameron,* D. D. S., guest editor, and *26 contributors.* 617 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., July 1957.

BLOOD PRESSURE SOUNDS AND THEIR MEANINGS, by *John Erskine Malcolm,* B. Sc., M. B., Ch. B., F. R. C. S. 93 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $2.50.

A PRACTICAL HANDBOOK OF PSYCHIATRY for Students and Nurses, by *Louis Minski,* M. D., F. R. C. P., D. P. M. 3d edition. 144 pages. Charles C Thomas, Publisher, Springfield, Ill., 1956. Price $3.

THE YEAR BOOK OF PATHOLOGY AND CLINICAL PATHOLOGY (1956-1957 Year Book Series), edited by *William B. Wartman,* B. S., M. D. 510 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $7.

TREVES' SURGICAL APPLIED ANATOMY, revised by *Lambert Charles Rogers,* V. R. D., M. D., M. Sc., F. R. C. S., F. R. C. S. E., F. R. A. C. S., F. A. C. S. 13th edition. 591 pages; 202 illustrations, 56 in color. Lea & Febiger, Philadelphia, Pa., 1957. Price $7.50.

THE YEAR BOOK OF ENDOCRINOLOGY (1956-1957 Year Book Series), edited by *Gilbert S. Gordan,* M. D., Ph. D., F. A. C. P. 377 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $6.75.

SUPRAPUBIC CLOSURE OF VESICOVAGINAL FISTULA, by *Vincent J. O'Conor,* B. S., M. D., F. A. C. S. American Lecture Series, Publication No. 306, A Monograph in American Lectures in Urology, edited by *Reed M. Nesbit,* M. D., F. A. C. S. 53 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $2.50.

THE DIAGNOSIS AND TREATMENT OF PULMONARY TUBERCULOSIS, by *Paul Dufault,* M. D. With chapters on Pathology by *A. Reynolds Crane,* M. D., and Pulmonary Function by *Oscar Feinsilver,* M. D. 2d edition. 426 pages; 162 illustrations and 1 plate in color. Lea & Febiger, Philadelphia, Pa., 1957. Price $9.

A FRONTAL SECTION ANATOMY OF THE HEAD AND NECK, by *Otto Frederic Kampmeier,* Ph. D., M. D.; *Arthur R. Cooper,* Ph. D., M. D.; and *Thomas S. Johnes,* B. F. A. 64 pages; illustrated. University of Illinois Press, Urbana, Ill., 1957. Price $15.

CLINICAL PHYSIOLOGY, The Functional Pathology of Disease, edited by *Arthur Grollman,* M. D., Ph. D., F. A. C. P. 854 pages; illustrated. The Blakiston Division, McGraw-Hill Book Co., Inc., New York, N. Y., 1957. Price $12.50.

MEDICAL DEPARTMENT, UNITED STATES ARMY, Surgery in World War II. Orthopedic Surgery in the Mediterranean Theater of Operations, by Colonel *Oscar P. Hampton,* Jr., MC, USAR. 368 pages; illustrated. Editor-in-Chief, Colonel *John Boyd Coates,* Jr., MC; Editor for Orthopedic Surgery, *Mather Cleveland,* M. D.; Associate Editor, *Elizabeth M. McFetridge,* M. A. Historical Unit, Army Medical Service, Office of the Surgeon General, Department of the Army, Washington 25, D. C., 1957. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Price $4.

THE YEAR BOOK OF NEUROLOGY, PSYCHIATRY AND NEUROSURGERY (1956-1957 Year Book Series). Neurology, edited by *Roland P. Mackay,* M. D. Psychiatry, edited by *S. Bernard Wortis,* M. D. Neurosurgery, edited by *Oscar Sugar,* M. D. 596 pages; illustrated. The Year Book Publishers, Inc., Chicago, Ill., 1957. Price $7.

CELL PHYSIOLOGY, by *Arthur C. Giese,* Ph. D. 534 pages; illustrated W. B. Saunders Co., Philadelphia, Pa., 1957.

Collected Paper of THE MAYO CLINIC and The Mayo Foundation, edited by *Richard M. Hewitt,* B. A., M. A., M. D.; *John R. Miner,* B. A., M. A., Ph. D.; *M. Katharine Smith,* B. A.; *Carl M. Gambill,* A. B., M. D., M. P. H.; *Florence L. Schmidt,* B. S. E.; and *George G. Stilwell,* A. B., M. D., and *Guy Whitehead,* B. A., M. A., Ph. D. Volume 48, 1956. 778 pages; illustrated. W. B. Saunders Co., Philadelphia, Pa., 1957.

PSYCHOSOMATIC MEDICINE, A Clinical Study of Psychophysiologic Reactions, by *Edward Weiss,* M. D., and *O. Spurgeon English,* M. D. 3d edition. 557 pages. W. B. Saunders Co., Philadelphia, Pa., 1957.

SYSTEMIC ARTERIAL EMBOLISM, Pathogenesis and Prophylaxis by *John Martin Askey,* M. D. 157 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $5.75.

J. A. M. A. CLINICAL ABSTRACTS OF DIAGNOSIS AND TREATMENT, Published with the Approval of the Board of Trustees, American Medical Association. 564 pages. Intercontinental Medical Book Corp. with Grune & Stratton, Inc., New York, N. Y., 1957. Price $5.50.

SCHIZOPHRENIA IN PSYCHOANALYTIC OFFICE PRACTICE, The Society of Medical Psychoanalysts, 1956 Symposium, edited by *Alfred H. Rifkin,* M. D. 30 contributors. 150 pages. Grune & Stratton, Inc., New York, N. Y., 1957. Price $4.

THE ELECTROCARDIOGRAM, Its Interpretation and Clinical Application, by *Louis H. Sigler,* M. D., F. A. C. P., F. C. C. P., F. A. C. C. 2d edition, revised. 312 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $8.75.

PROGRESS IN PSYCHOTHERAPY, edited by *Jules H. Masserman,* M. D., and *J. L. Moreno,* M. D. Volume 2, Anxiety and Therapy. 264 pages. Grune & Stratton, Inc., New York, N. Y., 1957. Price $7.50.

PERIPHERAL CIRCULATION IN HEALTH AND DISEASE, by *Walter Redisch,* M. D., F. A. C. P., and *Francisco F. Tangco,* M. D., B. S., with a special section by *R. L. deC. H. Saunders,* M. D., F. R. S. E., and associates. 154 pages; illustrated. Grune & Stratton, Inc., New York, N. Y., 1957. Price $7.75.

BRONCHOPULMONARY DISEASES, Basic Aspects, Diagnosis and Treatment, by 142 authors. Edited by *Emil A. Naclerio,* M. D., foreword by *Richard H. Overholt,* M. D. 956 pages; 719 illustrations. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, N. Y., 1957. Price $24.

KAPOSI'S SARCOMA, Multiple Idiopathic Hemorrhagic Sarcoma, by *Samuel M. Bluefarb,* B. S., M. D., F. A. C. P. American Lecture Series, Publication No. 308, A Monograph in The Bannerstone Division of American Lectures in Dermatology, edited by *Arthur C. Curtis,* M. D. 171 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $5.50.

DEGENERATIVE CHANGES IN THE STERNOCLAVICULAR AND ACROMIOCLAVICULAR JOINTS IN VARIOUS DECADES, by *Anthony F. DePalma,* M. D. American Lecture Series, Publication No. 309, A Monograph in The Bannerstone Division of American Lectures in Orthopaedic Surgery, edited by *Charles Weer Goff,* M. D. 178 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $5.50.

PLASTIC ARTERIAL GRAFTS, by *W. Sterling Edwards,* M. D. 126 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $4.50.

THE SURGICAL MANAGEMENT OF PULMONARY TUBERCULOSIS, edited by *John D. Steele,* M. D. Publication No. 1, The John Alexander Monograph Series on Various Phases of Thoracic Surgery. Editor, *John D. Steele,* M. D. 213 pages; illustrated. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $9.50.

PSYCHIATRY IN THEORY AND PRACTICE, by *Beulah Chamberlain Bosselman,* M. D. 150 pages. Charles C Thomas, Publisher, Springfield, Ill., 1957. Price $4.

U. S. GOVERNMENT PRINTING OFFICE : 1957 O -435996